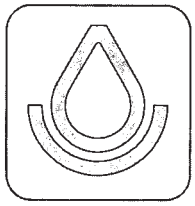
SOIL SURVEY OF
Pottawatomie County, Oklahoma



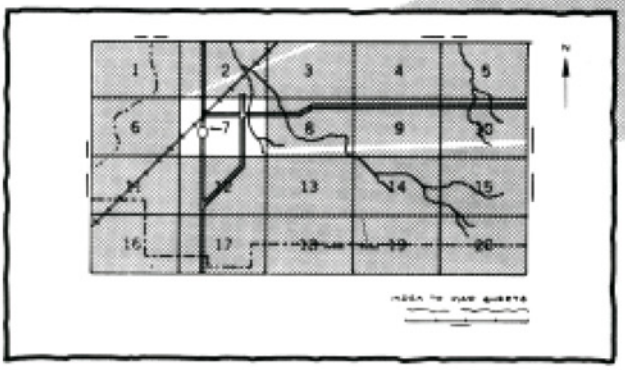
United States Department of Agriculture
Soil Conservation Service

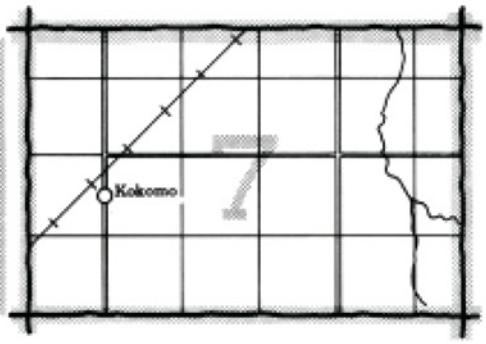
In cooperation with

Oklahoma Agricultural Experiment Station

HOW TO USE

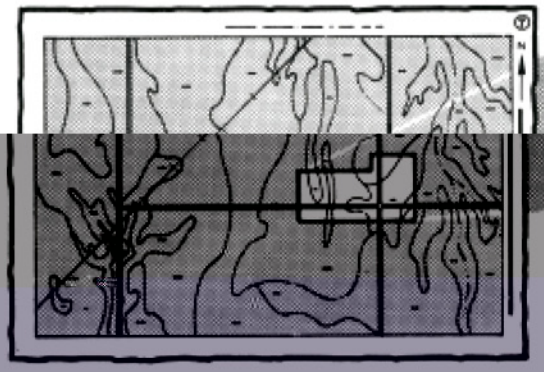
1. Locate your area of interest on the "Index to Map Sheets"

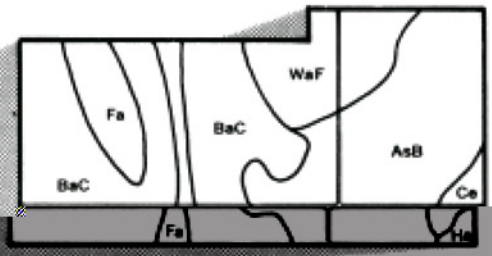




2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.



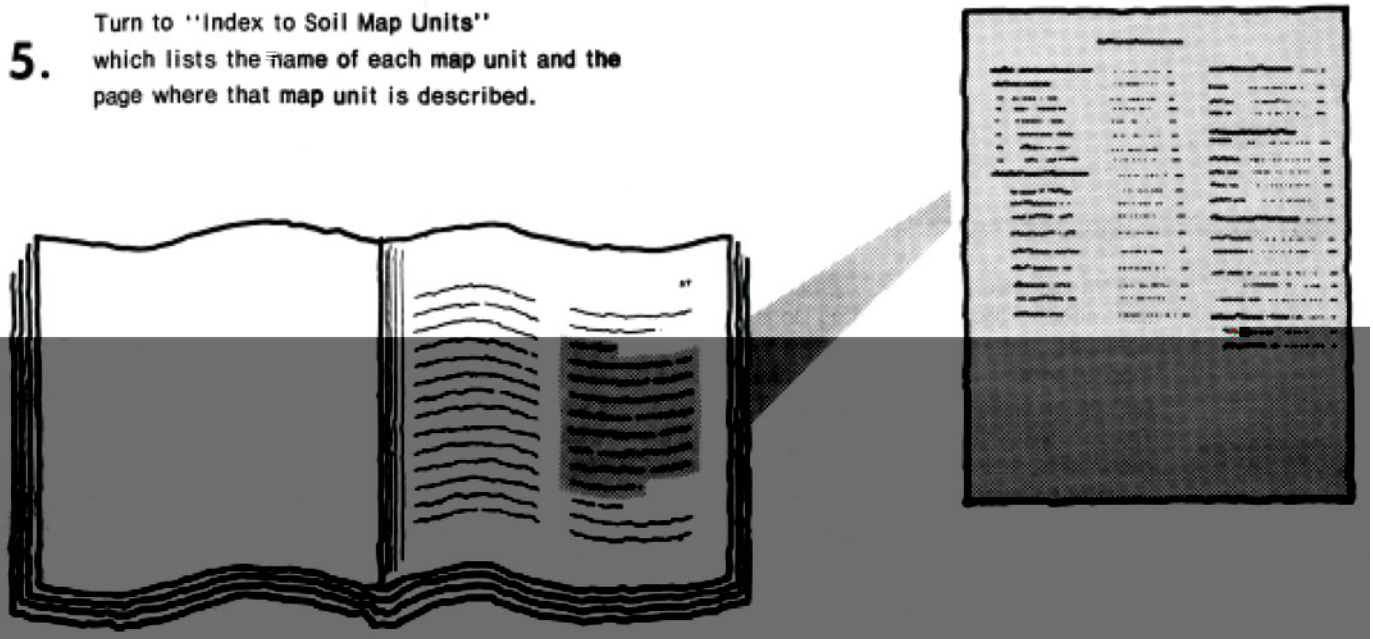


4. List the map unit symbols that are in your area.

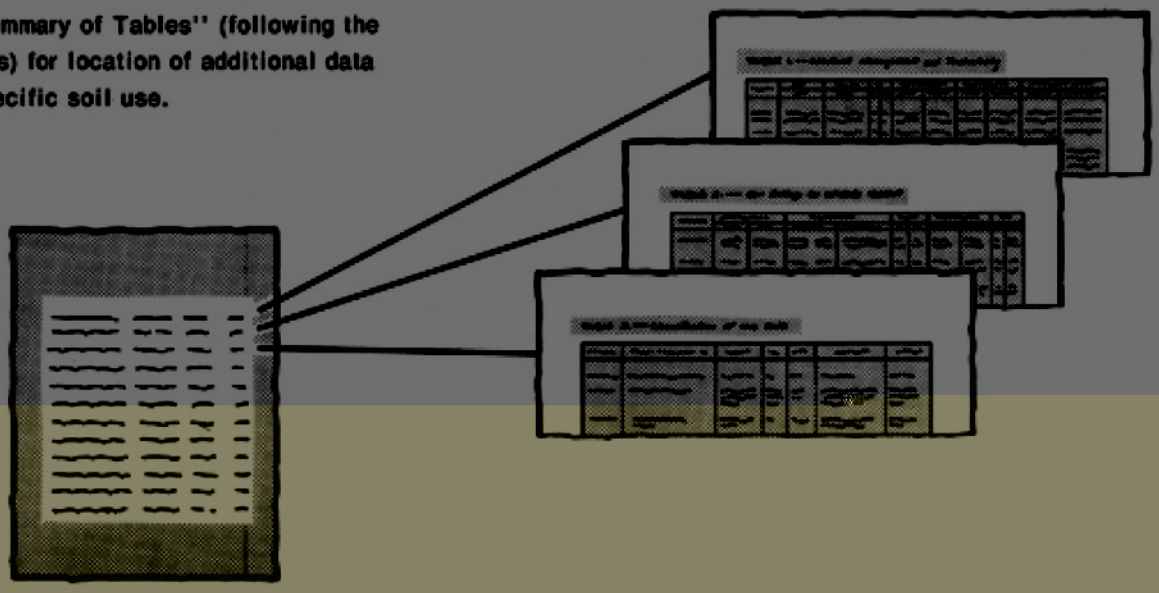
Symbols

THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



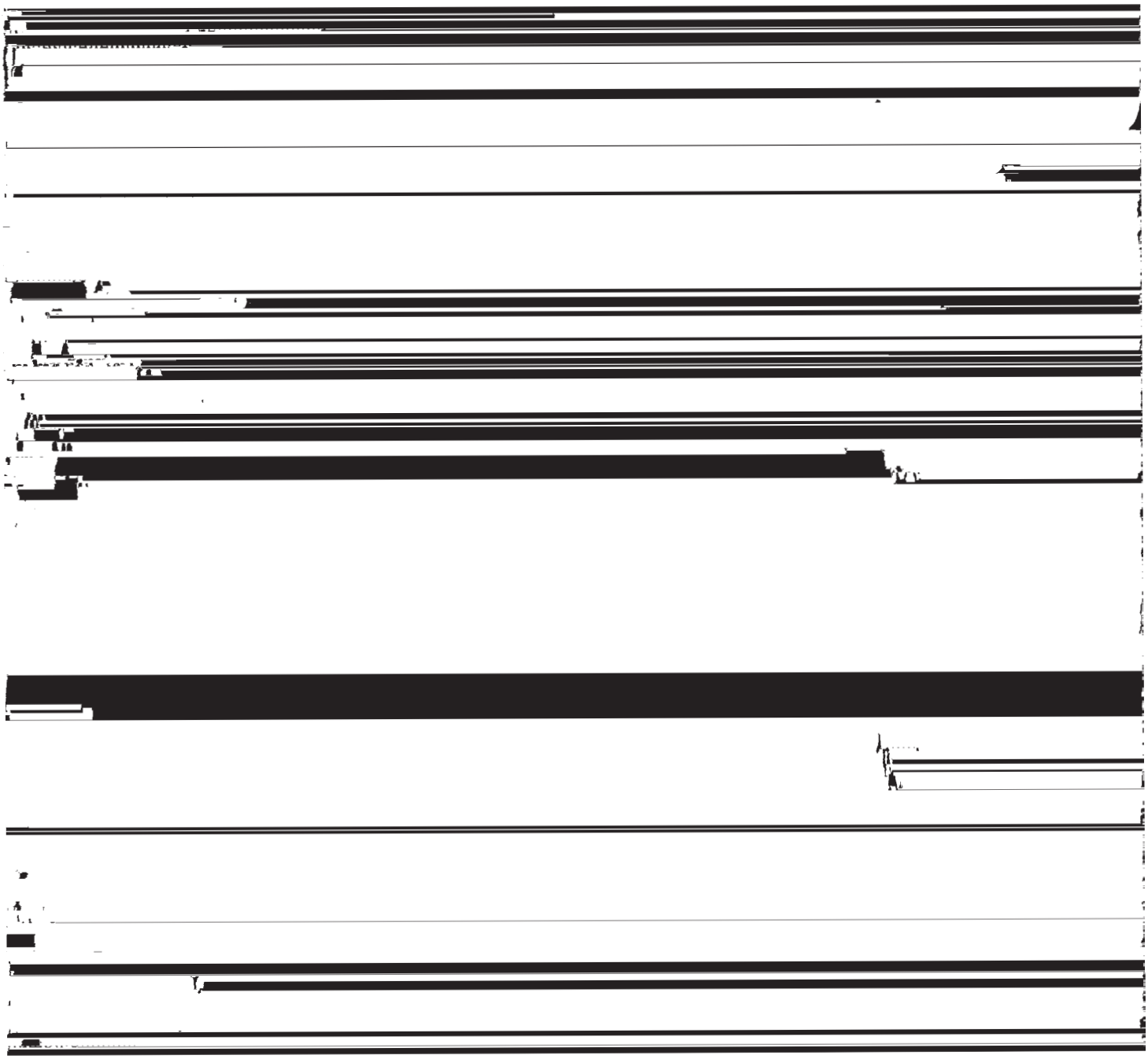
7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all who need the information, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1962-72. Soil names and descriptions were approved in 1974. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1974. This survey was made cooperatively by the Soil Conservation Service and the Oklahoma Agricultural Experiment Station. It is part of the technical assistance furnished to the Shawnee and Konawa Conservation Districts.

Soil maps in this survey may be copied without permission, but any enlargement of these maps could cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

Contents



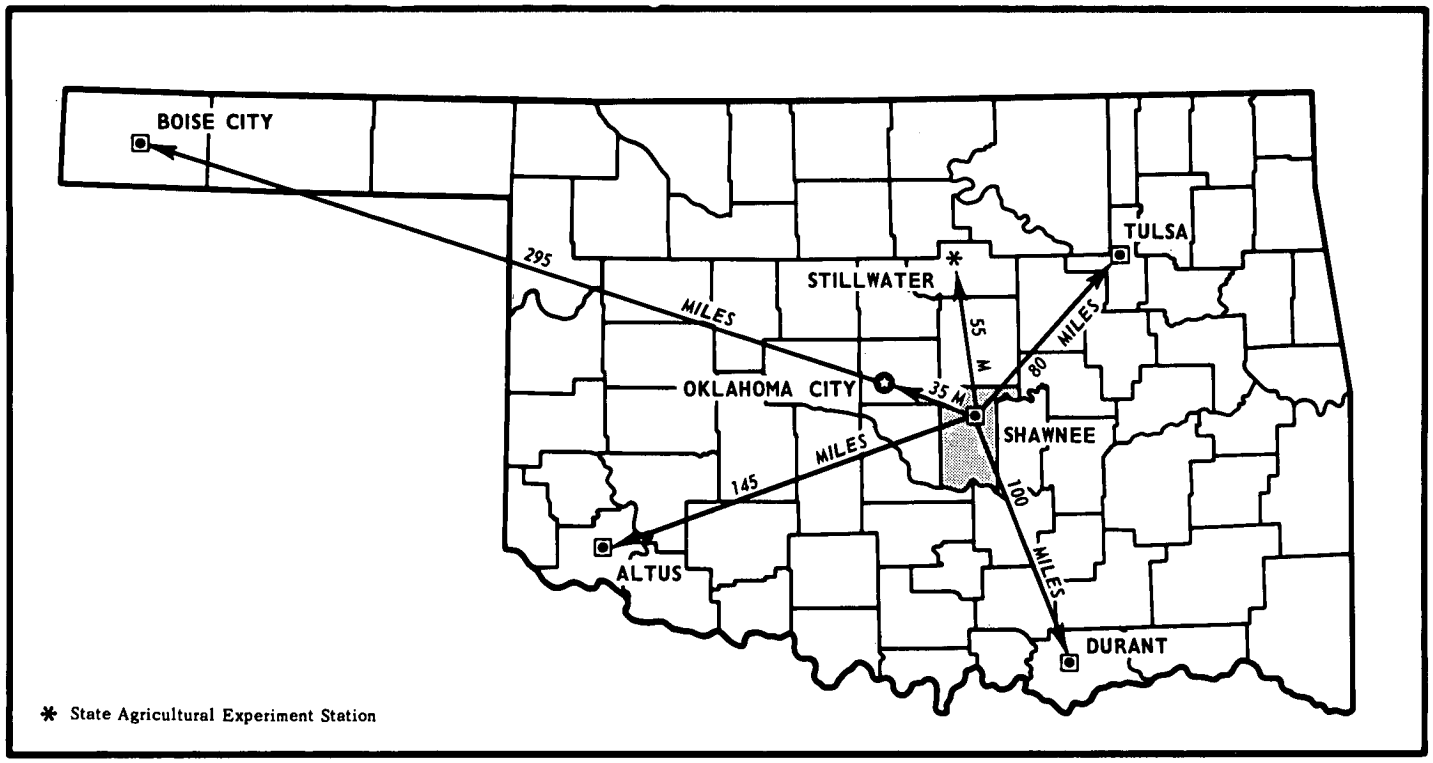
Index to Soil Mapping Units

Summary of Tables

Summary of Tables—Continued

Foreword

I would like to introduce the Soil Survey of Pottawatomie County, Oklahoma. You will find herein much basic information useful for any land planning program. Of prime importance are the predictions of soil behavior for



Location of Pottawatomie County in Oklahoma.

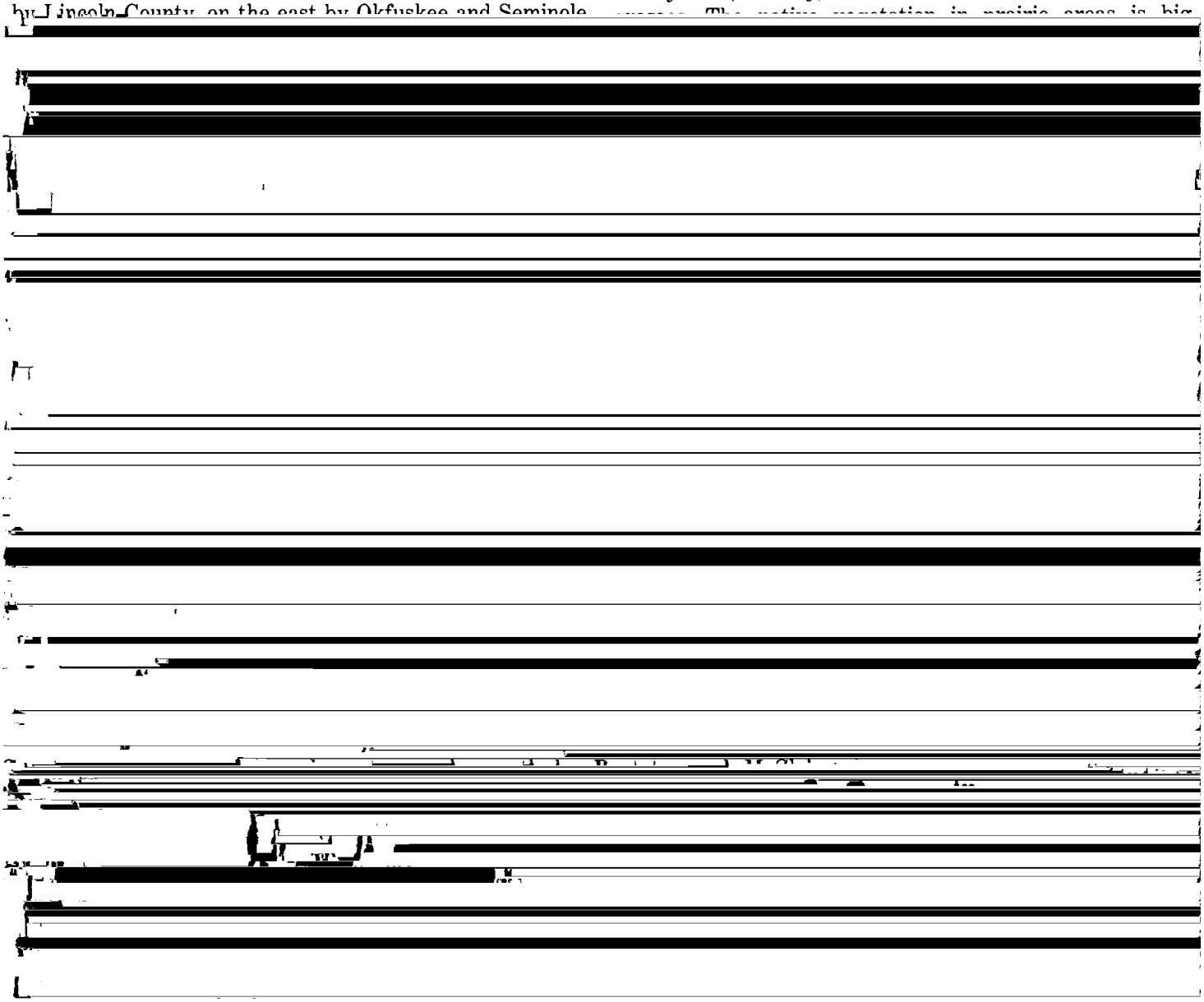
SOIL SURVEY OF POTTAWATOMIE COUNTY, OKLAHOMA

BY RICHARD E. MAYHUGH, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE OKLAHOMA AGRICULTURAL EXPERIMENT STATION

POTTAWATOMIE COUNTY is in the central part of Oklahoma (see facing page). The county is bounded on the west by Cleveland and Oklahoma counties, on the north by Lincoln County, on the east by Okfuskee and Seminole

Timbered and prairie soils are of about equal extent in the county. The native vegetation in timbered areas is mostly oaks, hickory, and redcedar with an understory of



The normal seasonal snowfall in Pottawatomie County is approximately 8 inches. There are 3 days during a normal snowfall season with 1 inch or more of snow and 4 or 5 days with an inch or more of snow on the ground. Since 1910, the greatest seasonal snowfall at Shawnee has been 20.9 inches in 1959-60. Several seasons since 1910 have not seen enough snow to measure.

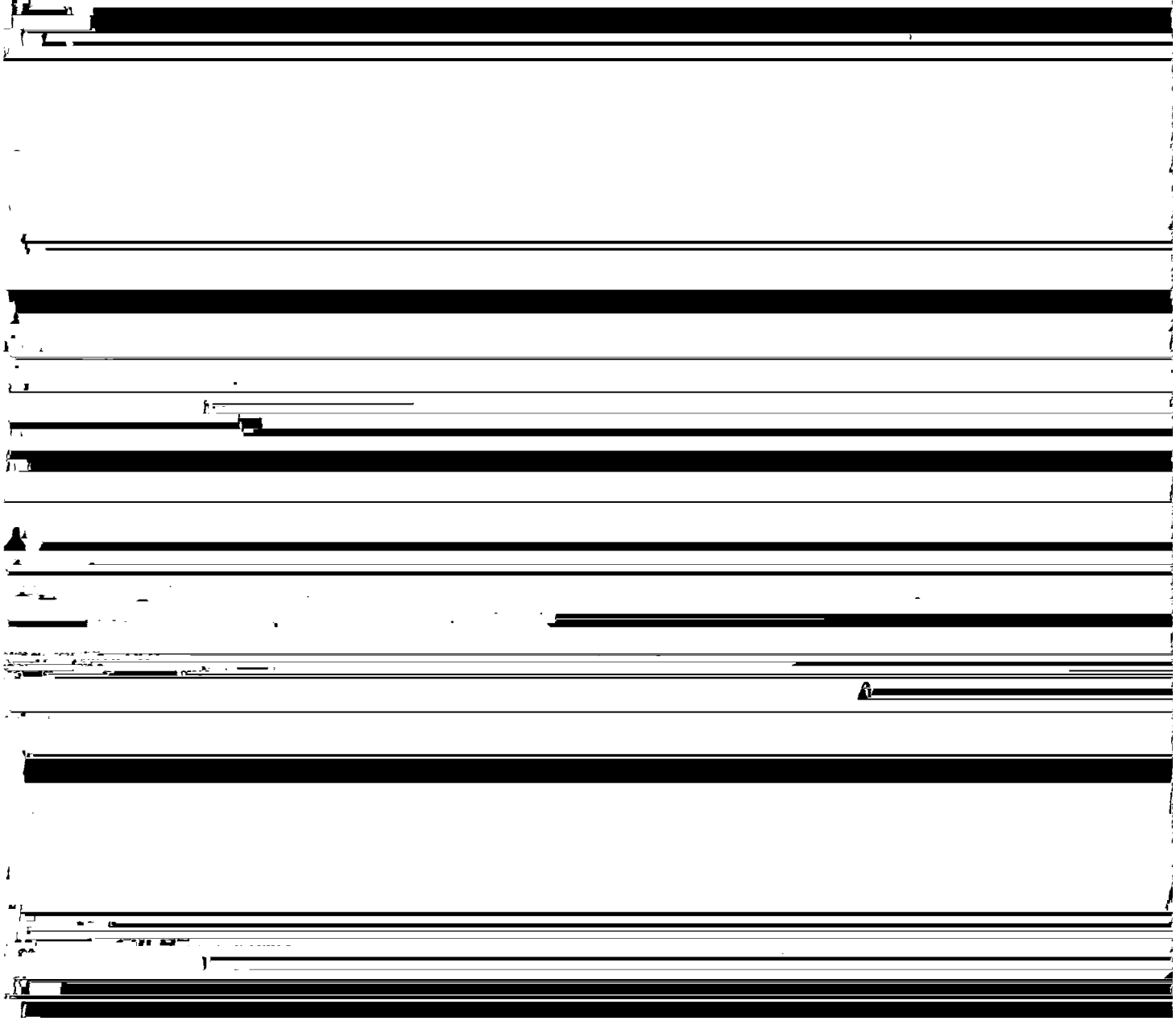
Temperatures of 90 degrees F or higher are frequent from June through September and have occurred from March through October. Temperatures of 100 degrees or higher occur on about 15 days in a normal year, mostly in July and August. The highest temperature of record at Shawnee was 116 degrees on August 10, 1936.

Temperatures are usually mild in winter (table 1) but there are occasional outbreaks of very cold air. Minimum

or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all



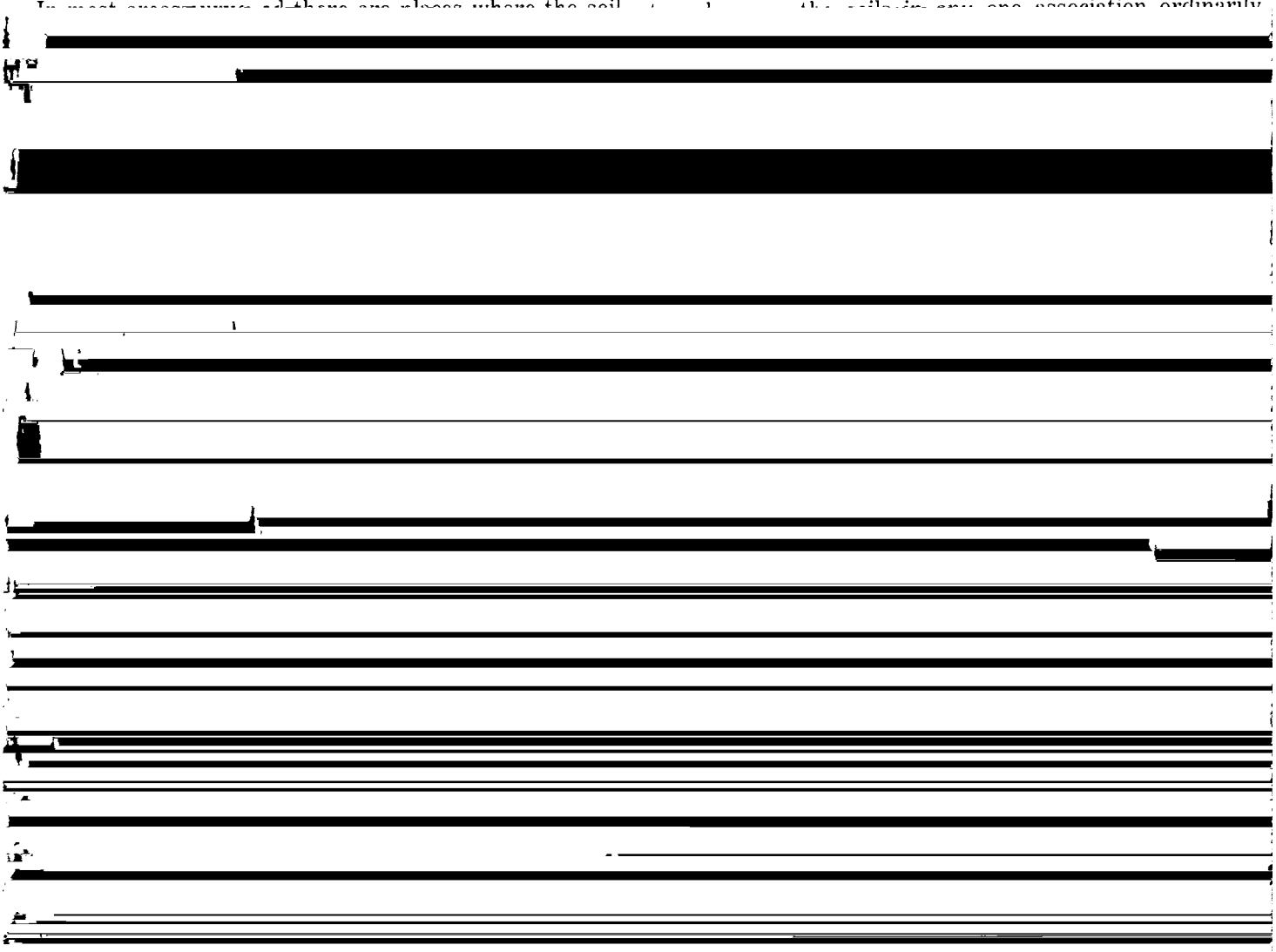
name or names of the dominant soils, joined by a hyphen. Stephenville-Darnell complex, 5 to 12 percent slopes, is an example.

An undifferentiated group is made up of two or more soils that could be delineated individually but that are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils, or of two or more. If there are two or more dominant series represented in the group, the name of the group ordinarily consists of the names of the dominant soils, joined by "and." Chickasha and Zaneis soils, 1 to 8 percent slopes, severely eroded is an example.

In most areas on the map there are places where the soil

portional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the locations of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field or for selecting the exact location of a road, building, or similar struc-



material is so rocky, so shallow, so severely eroded, or so variable that it has not been classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Gravel Pits is an example.

While a soil survey is in progress, soil scientists take soil samples needed for laboratory measurements and for

differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The soil associations in Pottawatomie County are discussed in the following pages.

The terms for texture used in the title for several of the associations apply to the texture of the surface layer. For example, in the title of association 1, the words

2. Weatherford-Chickasha Association

Deep, very gently sloping through sloping, well drained, loamy soils on uplands

This association makes up about 13 percent of the total land area of the county. About 39 percent is Weatherford soils, and 18 percent is Chickasha soils. The remaining 43 percent is soils of minor extent, mostly Aydelotte, Konawa, Port, Pulaski, Renfrow, Stephenville, Teller, Tribbey, Vernon, Windthorst, and other soils.

Weatherford soils are deep, very gently sloping through sloping, well drained, loamy soils with a loamy

This association makes up about 15 percent of the total land area of the county. About 31 percent is Aydelotte soils, 15 percent is Renfrow soils, and 13 percent is Zaneis soils (fig. 2). The remaining 41 percent is soils of minor extent, mostly Carytown, Chickasha, Kirkland, Norge, Port, Stephenville, Teller, Vanoss, Vernon, Weatherford, Windthorst, and other soils.

Aydelotte soils are deep, very gently sloping through sloping, well drained, loamy soils with a clayey or loamy subsoil over shale or clay.

Renfrow soils are deep, very gently sloping through gently sloping, well drained, loamy soils with a clayey or loamy subsoil over shale or clayey sediment.

This association makes up about 10 percent of the total land area of the county. About 67 percent is Vernon soils (fig. 4). The remaining 33 percent is soils of minor extent, mostly Aydelotte, Port, Pulaski, Renfrow, Stephenville, Teller, Weatherford, Yahola, Zaneis, and other soils.

Vernon soils are deep, gently sloping through strongly sloping, well drained, clayey or loamy soils with a clayey subsoil over shale or clayey sediment.

Most of the soils in this association are used for range. Some are suited to small grains, grain sorghums, peanuts, soybeans, and tame pasture grasses.

The principal management concern is keeping the grasses growing vigorously.

7. Seminole-Chickasha-Aydelotte Association

Deep, nearly level through sloping, moderately well drained or well drained, loamy soils on uplands

This association makes up about 5 percent of the total land area of the county. About 30 percent is Seminole soils, 14 percent is Chickasha soils, and 12 percent is Aydelotte soils (fig. 5). The remaining 44 percent is soils of minor extent, mostly Carytown, Norge, Port, Renfrow, Stephenville, Teller, Vanoss, Vernon, and Zaneis soils.

Seminole soils are deep, nearly level through gently sloping, moderately well drained, loamy soils with a clayey or loamy subsoil over clayey or loamy sediment on shale.

Chickasha soils are deep, very gently sloping through sloping, well drained, loamy soils with a loamy subsoil over sandstone.

Aydelotte soils are deep, very gently sloping through sloping, well drained, loamy soils with a clayey or loamy subsoil over clayey sediment or shale.

Most of the soils in this association are used for pasture or range. These soils are also suited to small grains, grain sorghum, peanuts, and soybeans.

The principal management concerns are maintaining soil structure and fertility and keeping erosion within allowable limits. The soil responds favorably to good management.

Descriptions of the Soils

In this section the soils of Pottawatomie County are described. Each soil series is described in detail, and then, briefly, the mapping units in that series are described. Unless it is specifically mentioned otherwise, it is to be assumed that what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any one mapping unit, it is necessary to read both the description of the mapping unit and the first is brief and in terms familiar to the layman. The second is much more detailed and is for those who need to make thorough and precise studies of soils. Color terms are for dry soil unless otherwise stated. The profile described in the soil series is representative for mapping units in that series. If a given mapping unit has a profile in some ways different from the one described in the series, these differences are stated in the description of the mapping unit or they are apparent in the name of the mapping unit. The description of each mapping unit contains suggestions on how the soil can be managed.

As mentioned in the section "How This Survey Was Made," not all mapping units are members of a soil series. Fluvents, for example, do not belong to a soil series; nevertheless they are listed in alphabetic order along with the soil series.

Preceding the name of each mapping unit is the symbol that identifies the mapping unit on the detailed soil map. Listed at the end of the description of each mapping unit are the capability unit, range site, pasture and hayland suitability group, windbreaks tree suitability group, and woodland suitability group in which the mapping unit has been placed.

The approximate acreage and proportionate extent of each mapping unit are shown in table 3. Many of the terms used in describing soils can be found in the Glossary, and more detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (*3*).

Asher Series

The Asher series consists of deep, moderately well drained, nearly level soils on flood plains. These soils formed under a cover of hardwood forest and grass in material weathered from loamy sediment.

In a representative profile the surface layer is 10 inches of dark gray silty clay loam. The subsoil, to a depth of 21 inches, is reddish brown silty clay loam. It is underlain by brown silt loam to a depth of 65 inches.

Asher soils have slow permeability. Available water capacity is high.

Representative profile of Asher silty clay loam, about 1,200 feet north and 50 feet east of the southwest corner of section 3, T. 11 N., R. 2 E.:

Ap—0 to 10 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) when moist; weak fine granular structure; hard, firm; many pores; mildly alkaline; abrupt smooth boundary.

B2—10 to 21 inches; reddish brown (5YR 5/3) silty clay loam, reddish brown (5YR 4/3) when moist; weak fine blocky structure; very hard, firm; secondary carbonates at 14 inch depth and below; dark gray (10YR 4/1) coatings on faces of some peds; calcareous; moderately alkaline; clear smooth boundary.

IIC—21 to 65 inches; brown (10YR 5/3) silt loam, brown (10YR 4/3)

through moderately alkaline. The B2 horizon is reddish brown, brown, dark reddish gray, or reddish gray. It ranges from neutral through moderately alkaline. The IIC horizon is brown, grayish brown, pale

The A1 or Ap horizon is reddish brown or brown. It is loam or clay loam and ranges from slightly acid through neutral. The B2t horizon is reddish brown, yellowish red, reddish yellow, red, or light reddish

material and the soil exposed at the surface are variable from one area to another. Native grasses and improved pasture grasses can be planted in most of these areas. Capability unit VIIe-1; no range site; pasture and hayland suitability group 8F; windbreaks tree suitability group 9; no woodland suitability group.

Carytown Series

The Carytown series consists of deep, poorly drained, nearly level soils on uplands. These soils formed under a cover of grass in material weathered from clayey sediment, loamy sediment, or shale.

In a representative profile the surface and subsurface layers are 11 inches of gray silt loam. The upper part of the subsoil, to a depth of 30 inches, is dark gray clay. The middle part, to a depth of 40 inches, is grayish brown clay. The lower part, to a depth of 70 inches or more, is brown clay.

Carytown soils have very slow permeability. Available water capacity is high. A water table is below a depth of 1 foot during spring in most years.

Representative profile of Carytown silt loam, 0 to 1 percent slopes, about 400 feet north and 100 feet west of the southeast corner of section 20, T. 8 N., R. 5 E.:

A1—0 to 9 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) when moist; weak fine granular structure; slightly hard, very friable; neutral; clear smooth boundary.

A2—9 to 11 inches; gray (10YR 6/1) silt loam, very dark gray (10YR 3/1) when moist; massive; slightly hard, friable; neutral; abrupt smooth boundary.

B21t—11 to 30 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) when moist; weak coarse columnar breaking to moderate medium blocky structure; very hard, very firm; clay films on faces of peds; about 20 percent exchangeable sodium; mildly alkaline; clear smooth boundary.

B22t—30 to 40 inches; grayish brown (10YR 5/2) clay, dark grayish

This Carytown soil is used mostly for small grains and grain sorghum. It is also suited to alfalfa hay, soybeans, tame pasture grasses, and native grasses.

The main concerns of management are improving soil structure, reducing surface crusting, and maintaining soil fertility. Returning large amounts of crop residue to the soil and adding plant food are good management practices. Capability unit IIIw-2; Claypan Prairie range site; pasture and hayland suitability group 8D; windbreaks tree suitability group 9; no woodland suitability group.

Chickasha Series

The Chickasha series consists of deep, well drained, very gently sloping through sloping soils on uplands. These soils formed under a cover of grass in material weathered from sandstone.

In a representative profile the surface layer is 14 inches of dark grayish brown loam. The next layer to a depth of 22 inches is yellowish brown loam. The subsoil, to a depth of 53 inches, is strong brown and yellowish red sandy clay loam. It is underlain by light gray weathered sandstone to a depth of 65 inches or more.

Chickasha soils have moderate permeability. Available water capacity is high.

Representative profile of Chickasha loam, 1 to 3 percent slopes, about 1,350 feet south and 50 feet east of the northwest corner of section 3, T. 9 N., R. 3 E.:

A1—0 to 14 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) when moist; moderate fine granular structure; slightly hard, very friable; slightly acid; gradual smooth boundary.

B1—14 to 22 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) when moist; weak medium subangular blocky structure; slightly hard, friable; patchy clay films on faces of peds; slightly acid; gradual smooth boundary.

B21t—22 to 36 inches; strong brown (7.5YR 5/6) sandy clay loam, strong

horizon is yellowish red, reddish yellow, yellowish brown, light yellowish brown, or brown. It is sandy clay loam or loam and ranges from medium acid through moderately alkaline. Depth to rippable sandstone is 40 to 60 inches.

6—Chickasha loam, 1 to 3 percent slopes. This soil is very gently sloping. It has the profile described as representative for the series.

Included with this soil in mapping are soils that are similar to Chickasha loam except that they are 20 to 40 inches thick over sandstone or they have gray mottles at a depth of 30 to 40 inches. These soils make up about 10 percent of each mapped area. Also included are Weatherford, Stephenville, Seminole, Renfrow, and Zaneis soils. These soils together make up about 10 percent of each mapped area.

Most of this Chickasha soil is used for tame pasture grasses and native grasses. It is also suited to small grains, alfalfa hay, grain sorghum, peanuts, and soybeans.

The main concerns of management are the hazard of erosion and the structure and fertility of the soil.

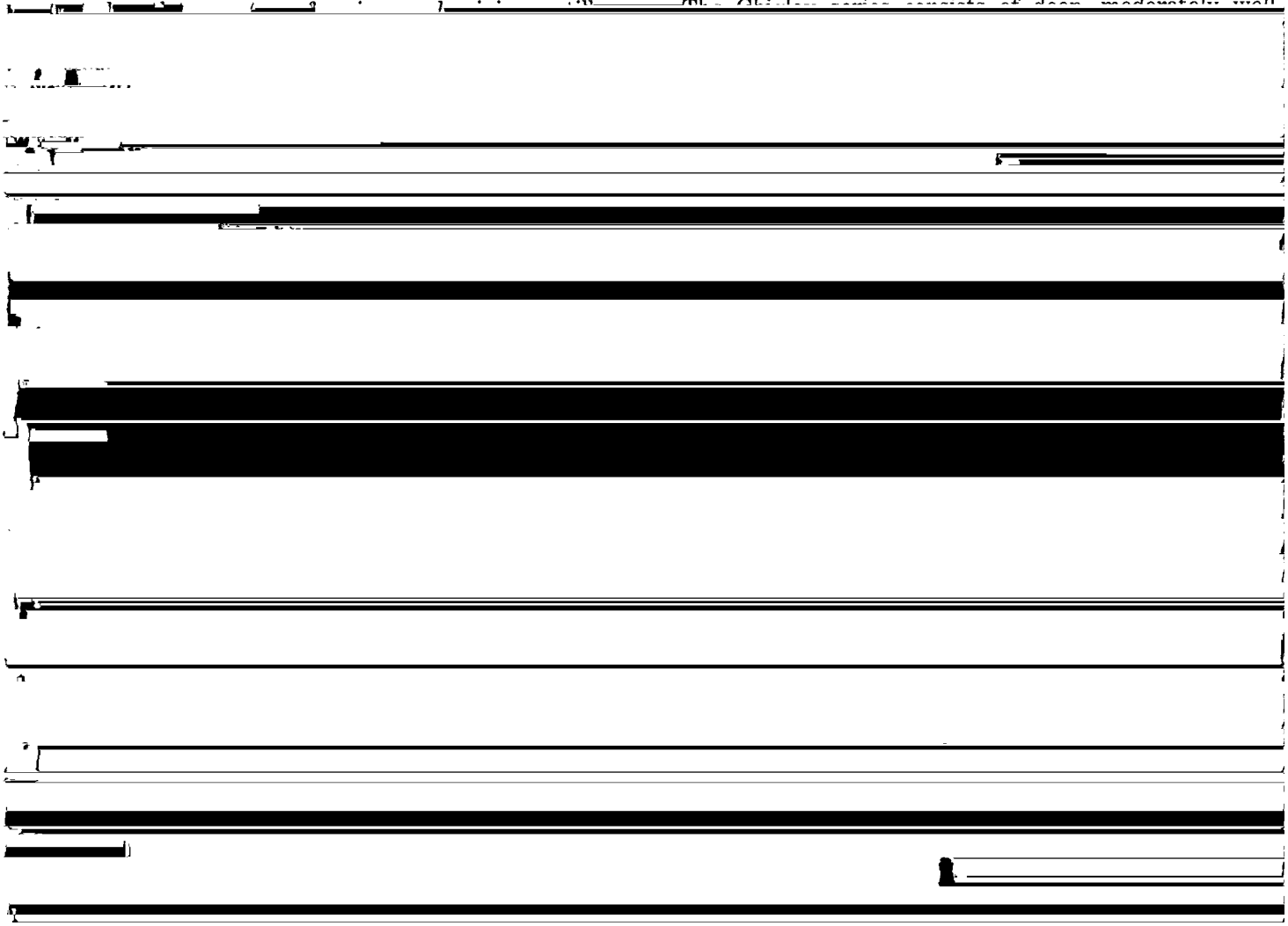
Most adapted crops can be grown if this soil is well managed. Returning crop residue to the soil and using plant food are good management practices. Terraces with sandy loam and is thinner and mixed with the subsoil in places. Chickasha and Zaneis soils occur without regularity of pattern.

Included with these soils in mapping are soils that are similar to Chickasha and Zaneis soils. In some of these similar soils, the surface layer is thinner or it is material from the subsoil. In others sandstone is at a depth of 20 to 40 inches. These similar soils make up about 20 percent of each mapped area. Also included are gullies that are 2 to 5 feet deep and 10 to 50 feet wide. These gullies make up about 20 percent of each mapped area. Teller, Norge, Seminole, and Vanoss soils together make up about 25 percent.

Chickasha and Zaneis soils are used mostly for native grasses. They are also suited to tame pasture grasses.

The main concerns of management are the vigor of growing grasses and the hazard of erosion. Capability unit VIe-4; Eroded Prairie range site; pasture and hayland suitability group 8F; windbreaks tree suitability group 8; no woodland suitability group.

Chigley Series



The A horizon is 25 to 30 percent gravel, by volume. The A1 horizon is grayish brown or brown. It ranges from medium acid through neutral. The A2 horizon ranges from medium acid through neutral. The B horizon is 5 to 30 percent gravel, by volume. The B21t horizon is red or yellowish red. It is gravelly sandy clay, sandy clay, or clay and ranges from strongly acid through slightly acid. The B22t horizon is red or yellowish red. It ranges from medium acid through mildly alkaline. The C horizon is reddish brown or yellowish red. Depth to rippable conglomerate is 40 to 70 inches.

9—Chigley complex, 3 to 12 percent slopes. These soils are gently sloping through strongly sloping. They

Dougherty Series

The Dougherty series consists of deep, well drained, nearly level through sloping soils on uplands. These soils formed under a cover of hardwood forest and grass in material weathered from sandy and loamy sediments.

In a representative profile the surface layer is 6 inches of pinkish gray loamy fine sand. The subsurface layer, to a depth of 23 inches, is light brown loamy fine sand. The upper part of the subsoil, to a depth of 40 inches, is red

The main concerns of management are the hazards of soil blowing, water erosion, and the fertility of the soil. The condition of the soil can be maintained or improved by systematically returning organic materials and by adding plant food. Erosion can be controlled if a vegetative

A22&B2t—42 to 72 inches; light brown (7.5YR 6/4) fine sand, brown (7.5YR 5/4) when moist; single grained; soft, loose; medium acid; alternating layers of yellowish red (5YR 5/6) loamy fine sand and fine sandy loam that average loamy fine sand, yellowish red (5YR 4/6) when moist; single grained; slightly hard, friable; the yellowish red layers are 1/8 to 1 inch thick and 1 to 4 inches apart with clay films

land during periods of critical high winds. Capability unit IIIe-4; Deep Sand Savannah range site; pasture and hayland suitability group 9A; windbreaks tree suitability group 8; no woodland suitability group.

11—Dougherty loamy fine sand, 3 to 8 percent slopes. This soil is gently sloping through sloping. It has the profile described as representative for the series (fig. 6).

Included with this soil in mapping are soils that are similar to Dougherty loamy fine sand but have gray mot-

The A1 or Ap horizon is grayish brown, dark grayish brown, brown, or pale brown. It ranges from medium acid through neutral. The A2 horizon is very pale brown, light yellowish brown, light brown, pink, pinkish gray, or pale brown. It is fine sand or loamy fine sand and ranges from medium acid through neutral. The B2t horizon is yellowish red or reddish yellow. It is loamy fine sand or fine sandy loam that averages loamy fine sand and ranges from strongly acid through slightly acid. The B2t horizon is alternating layers between layers of material from the A2 horizon.

Fluvents

14—Fluvents, 8 to 15 percent slopes. This unit consists of deep, well drained, strongly sloping through moderate-

most of the year. These similar soils make up about 15 percent of each mapped area. Also included are Yahola soils, which make up about 10 percent, and Gracemore soils, which make up about 5 percent.

Most of this Caddo soil is used for tame pasture

Included with this soil in mapping are soils that are similar to Galey fine sandy loam but have gray mottles at a depth of 20 to 30 inches or a very dark grayish brown surface layer. These similar soils make up about 20 per-

The main concerns of management are frequent flooding, fertility of the soil, and overgrazing. Capability unit Vw-2; Subirrigated range site; pasture and hayland suitability group 2B; windbreaks tree suitability group 1; woodland suitability group 3w4

which make up about 20 percent.

This Galey soil is used mostly for peanuts, small grains, and grain sorghum. It is also suited to alfalfa hay, soybeans, tame pasture grasses, and native grasses. About half of the acreage of this Galey soil is irrigated.

The main concerns of management are the hazard of erosion and the structure and fertility of the soil. Most crops that produce large amounts of residue can be grown

Gracemore Series

The Gracemore series consists of deep, somewhat poorly drained, nearly level through very gently sloping soils on flood plains. These soils formed under a cover of hardwood forest and grass in material weathered from sandy sediment.

at the surface, ranges from loamy to sandy. Native grasses and improved pasture can be established in these areas. Cabability unit VIIe-2; no range site; pasture and hayland suitability group 8F; windbreaks tree suitability group 9; no woodland suitability group.

Harjo Series

The Harjo series consists of deep, poorly drained, nearly level soils on flood plains. These soils formed under a cover of hardwood forest and grass in material weathered from clayey and loamy sediment.

In a representative profile the surface layer is 10 inches of dark red clay. The underlying material to a depth of 65 inches is reddish brown and red clay.

Harjo soils have very slow permeability. Available water capacity is high. These soils have water ponded on the surface or a water table within 1 foot of the surface most of the year.

Representative profile of Harjo clay, about 400 feet west and 1,100 feet north of the southeast corner of section 8, T. 7 N., R. 5 E.:

A1—0 to 10 inches; dark red (2.5YR 3/6 when moist) clay; weak coarse platy structure in the upper part and weak medium subangular blocky structure in the lower part; extremely hard, firm; calcareous;

Keokuk Series

The Keokuk series consists of deep, well drained, nearly level soils on flood plains. These soils formed under a cover of hardwood forest and grass in material weathered from loamy and sandy sediment.

In a representative profile the surface layer is 12 inches of dark grayish brown silt loam. The subsoil, to a depth of 24 inches, is brown silt loam. The underlying material to a depth of 65 inches is light brown very fine sandy loam.

Keokuk soils have moderate permeability. Available water capacity is high.

Representative profile of Keokuk silt loam, about 1,850 feet east and 200 feet south of the northwest corner of section 29, T. 11 N., R. 5 E.:

A1—0 to 12 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) when moist; moderate fine granular structure; hard, very friable; slightly acid; gradual smooth boundary.

B2—12 to 24 inches; brown (7.5YR 5/2) silt loam, brown (7.5YR 4/2) when moist; weak medium subangular blocky structure; slightly hard, very friable; mildly alkaline; gradual smooth boundary.

C—24 to 65 inches; light brown (7.5YR 6/4) very fine sandy loam, brown (7.5YR 5/4) when moist; massive; slightly hard, very friable; few thin layers of silt loam, loam, and loamy very fine sand; few soft

Kirkland Series

The Kirkland series consists of deep, well drained, nearly level soils on uplands. These soils formed under a cover of grass in material weathered from clayey sediment or shale.

In a representative profile the surface layer is 7 inches of brown silt loam. The next layer, to a depth of 13

fertility and to increase the intake rate of water. Capability unit IIs-1; Claypan Prairie range site; pasture and hayland suitability group 8C; windbreaks tree suitability group 6; no woodland suitability group.

Konawa Series

The Konawa series consists of deep, well drained,

similar soils make up about 10 percent of each mapped area. Also included are Dougherty soils, which make up about 15 percent, and Weatherford soils, which make up about 10 percent.

Most of this Konawa soil is used for tame pasture

The main concerns of management are the hazard of erosion and the structure and fertility of the soil. Where row crops are grown, terraces and contour farming are needed. Large amounts of residue can be returned to the soil and plant food can be added to help maintain soil

IIC1—35 to 72 inches; pink (5YR 7/3) very fine sandy loam, light reddish brown (5YR 6/3) when moist; few fine brownish mottles; massive; slightly hard, very friable; common strata of pink (5YR 7/4) loamy fine sand and reddish brown (5YR 5/3) silty clay loam as much as 3 inches thick; calcareous; moderately alkaline.

The A1 or Ap horizon is dark reddish gray, reddish brown, or dark brown. It ranges from neutral through moderately alkaline. The B2 horizon is silty clay or clay and ranges from mildly alkaline through moderately alkaline. The IIC horizon is pink, pinkish gray, light reddish brown, or light brown. It is loam or very fine sandy loam with thin strata of more sandy or more clayey material.

27—Latanier silty clay loam. This soil is nearly level. It is subject to occasional flooding.

Included with this soil in mapping are soils that are similar to Latanier silty clay loam except that the surface layer is light reddish brown or the combined thickness of the surface layer and subsoil is more than 40 inches. These similar soils make up about 25 percent of each mapped area. Also included are Yahola soils, which make up about 15 percent of each mapped area.

Latanier soil is used mostly for tame pasture grasses, grain sorghum, and annual hay crops. It is also suited to [redacted]

structure; very hard, very firm; many intersecting slickensides; thin loamy strata below a depth of 34 inches have been rearranged from horizontal to uncomforming angles; calcareous; moderately alkaline.

The A1 or Ap horizon is very dark gray, dark gray, very dark grayish brown, dark grayish brown, dark reddish gray, dark reddish brown, reddish gray, or brown. It ranges from neutral through mildly alkaline. The AC horizon is brown, dark reddish gray, reddish gray, reddish brown, or grayish brown. It is silty clay or clay.

28—Lela silty clay. This soil is nearly level. It is subject to occasional flooding.

Included with this soil in mapping are soils that are similar to Lela silty clay but have loamy sediment at a depth of 27 to 40 inches or a slightly less clayey surface layer. These similar soils make up about 25 percent of each mapped area. Also included are Miller and Asher soils, each of which makes up about 5 percent.

This Lela soil is used mostly for small grains, alfalfa hay, or grain sorghum. It is also suited to soybeans, tame pasture grasses, and native grasses.

The main concerns of management are occasional flooding, surface wetness, drainage, and the structure and fertility of the soil. Most crops grown on this soil produce

The A1 or Ap horizon is reddish brown or dark reddish gray. It ranges from mildly alkaline through moderately alkaline. The B2 horizon is reddish brown or dark reddish brown. It ranges from mildly alkaline through moderately alkaline. The C horizon is red, reddish brown, or yellowish red.

29—Miller clay loam. This soil is nearly level. It is subject to occasional flooding.

Included with this soil in mapping are soils that are similar to Miller clay loam. Some of these similar soils are not calcareous at a depth of 10 to 20 inches, and some have loam or fine sandy loam recent sediment in the upper 30 inches. Others have horizons of salt accumulation. These similar soils make up about 17 percent of each mapped area. Also included are Port soils, which make up about 5 percent of each mapped area.

This Miller soil is used mostly for tame pasture grasses, small grains, grain sorghum, alfalfa hay, and annual hay crops. It is also suited to soybeans and native grasses.

The main concerns of management are occasional flooding, surface wetness, and the structure and fertility of the soil. Most crops grown on this soil produce large amounts of residue and can be grown continuously where the residue is returned to the soil and plant food is added. Capability unit IIIw-1; Heavy Bottomland range site; pasture and hayland suitability group 1A; windbreaks tree suitability group 5; no woodland suitability group.

Noble Series

The Noble series consists of deep, well drained, gently sloping through sloping soils on uplands. These soils formed under a cover of hardwood forest and grass in material weathered from loamy sediment.

In a representative profile the surface layer is 10 inches of reddish brown fine sandy loam. The subsoil, to a depth of 40 inches, is red fine sandy loam. The underlying material to a depth of 60 inches is red fine sandy loam.

Noble soils have moderately rapid permeability. Available water capacity is high.

Representative profile of Noble fine sandy loam, 3 to 8 percent slopes, about 600 feet north and 30 feet west of the southeast corner of section 22, T. 7 N., R. 2 E.:

A1—0 to 10 inches; reddish brown (5YR 5/4) fine sandy loam, dark reddish brown (5YR 3/4) when moist; moderate fine granular structure; slightly hard, very friable; slightly acid; clear smooth boundary.

B2—10 to 40 inches; red (2.5YR 4/6) fine sandy loam, dark red (2.5YR 3/6) when moist; weak coarse prismatic breaking to weak medium subanglar blocky structure; hard, very friable; medium acid; gradual smooth boundary.

C—40 to 60 inches; red (2.5YR 4/6) fine sandy loam, dark red (2.5YR 3/6) when moist; weak coarse prismatic breaking to weak coarse subangular blocky structure; hard, very friable; slightly acid.

The A1 or Ap horizon is reddish brown or brown and ranges from slightly acid through medium acid. The B2 horizon is red, reddish brown, or yellowish red and ranges from slightly acid through medium acid. The C horizon is red, reddish brown, or yellowish red and ranges from slightly acid through medium acid.

30—Noble fine sandy loam, 3 to 8 percent slopes. This is a gently sloping through sloping soil.

Included with this soil in mapping are soils that are similar to Noble fine sandy loam except that the subsoil is slightly more clayey or the surface layer is slightly darker. These soils make up about 25 percent of each mapped area. Also included are Teller soils, which make up about 5 percent.

This Noble soil is used mostly for tame pasture grasses and native grasses. It is also suited to small grains and grain sorghum.

The main concerns of management are the hazard of erosion and the structure and fertility of the soil. Large amounts of residue can be returned to the soil and plant food can be added to help maintain soil structure and fertility and to control erosion. Where crops are grown, terraces with protected outlets, contour farming, and minimum tillage are needed. Capability unit IVe-3; Sandy Savannah range site; pasture and hayland suitability group 8A; windbreaks tree suitability group 8; no woodland suitability group.

Norge Series

The Norge series consists of deep, well drained, very gently sloping through gently sloping soils on uplands. These soils formed under a cover of grass in material weathered from loamy sediment.

In a representative profile the surface layer is 12 inches of dark brown loam. The next layer, to a depth of 18 inches, is reddish brown loam. The subsoil to a depth of 60 inches is yellowish red and red clay loam.

Norge soils have moderately slow permeability. Available water capacity is high.

Representative profile of Norge loam, 3 to 5 percent slopes, about 1,600 feet north and 500 feet east of the southwest corner of section 18, T. 11 N., R. 3 E.:

A1—0 to 12 inches; dark brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) when moist; moderate fine granular structure; slightly hard, very friable; neutral; gradual smooth boundary.

B1—12 to 18 inches; reddish brown (5YR 4/4) loam, dark reddish brown (5YR 3/4) when moist; weak fine subangular blocky structure; hard, friable; slightly acid; clear smooth boundary.

B21t—18 to 32 inches; yellowish red (5YR 5/6) clay loam, yellowish red (5YR 4/6) when moist; weak medium subangular blocky structure; hard, firm; thin continuous clay films on faces of peds; slightly acid; gradual smooth boundary.

B22t—32 to 44 inches; red (2.5YR 5/6) clay loam, red (2.5YR 4/6) when moist; weak medium subangular blocky structure; hard, firm; thin continuous clay films on faces of peds; slightly acid; gradual smooth boundary.

B3—44 to 60 inches; red (2.5YR 5/6) clay loam, red (2.5YR 4/6) when moist; weak coarse subangular blocky structure; hard, firm; thin clay films on faces of some peds; slightly acid.

The A1 or Ap horizon is dark brown, brown, grayish brown, or dark grayish brown. It ranges from medium acid through neutral. The B1 horizon is reddish brown or brown. It is loam or silty clay loam and ranges from medium acid through slightly acid. The B2t horizon is yellowish red, red, or reddish brown. It is clay loam or silty clay loam and ranges from medium acid through neutral. The B3 horizon is red or yellowish red. It is clay loam or silty clay loam and ranges from slightly acid through moderately alkaline.

31—Norge loam, 1 to 3 percent slopes. This is a very gently sloping soil. Included with this soil in mapping are soils that are similar to Norge loam except that the subsoil is slightly more clayey. Also included are Teller soils. These included soils each make up about 10 percent of each mapped area.

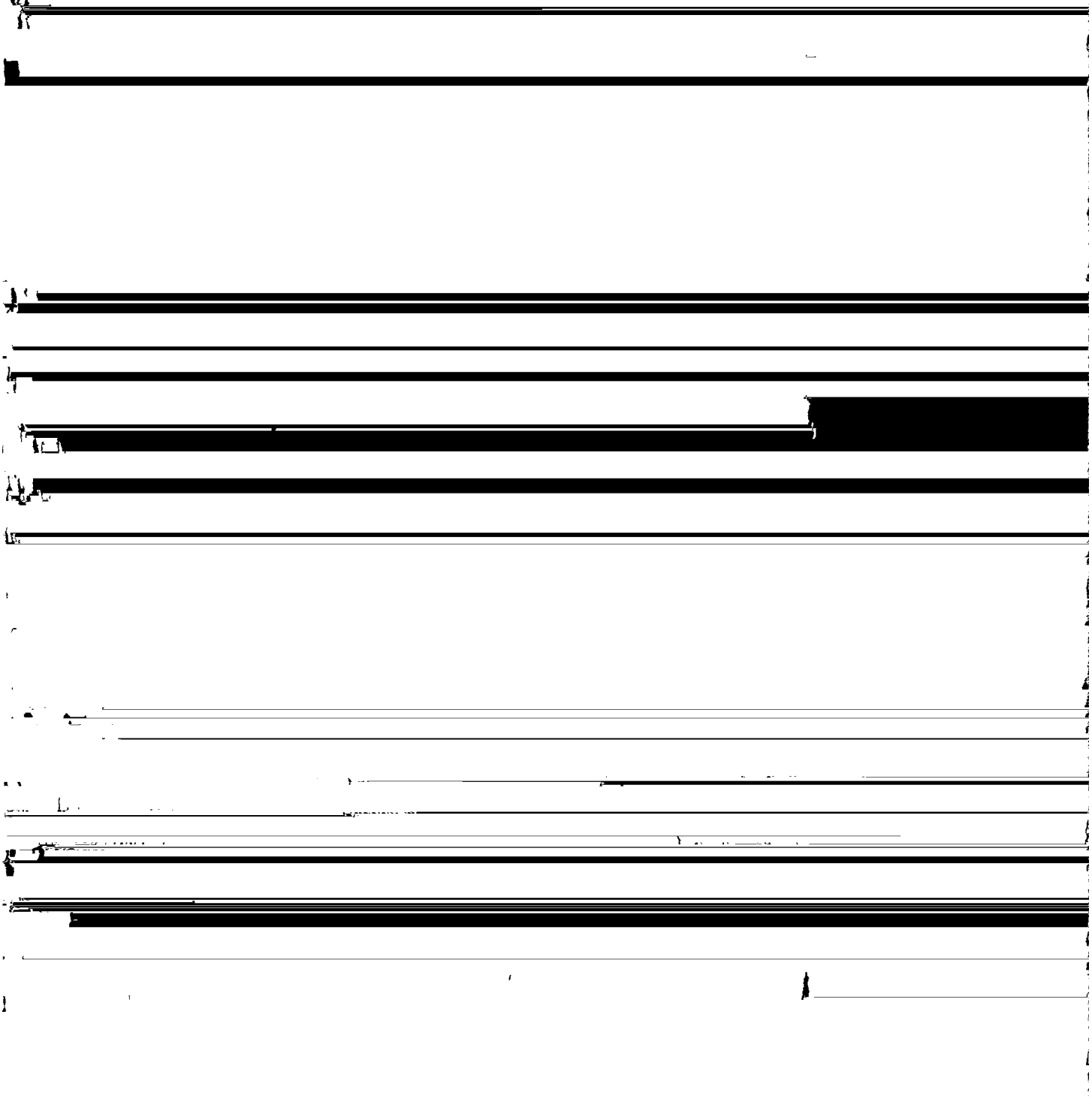
This Norge soil is used mostly for tame pasture grasses, small grains, grain sorghum, annual hay crops, alfalfa hay, peanuts, soybeans, and native grasses.

A1—0 to 23 inches; reddish brown (5YR 4/3) loam, dark reddish brown (5YR 3/3) when moist; weak medium granular structure; hard, friable; neutral; clear smooth boundary.

B21—23 to 36 inches; reddish brown (2.5YR 4/4) clay loam, dark reddish brown (2.5YR 3/4) when moist; weak medium subangular blocky structure; hard, friable; slightly acid; gradual smooth boundary.

B22—36 to 52 inches; red (2.5YR 4/6) loam, dark red (2.5YR 3/6) when moist; weak medium subangular blocky structure; hard, friable; slightly acid; gradual smooth boundary.

C—52 to 72 inches; red (2.5YR 4/6) loam, dark red (2.5YR 3/6) when moist; massive; hard, friable; few soft spots of calcium carbonate;



Port soils are used mostly for tame pasture grasses, native grasses, or hardwood trees.

The main concerns of management are frequent flooding, the fertility of the soils, and overgrazing. Capability unit Vw-1; Loamy Bottomland range site; pasture and hayland suitability group 2A; windbreaks tree suitability group 4; woodland suitability group 3o4.

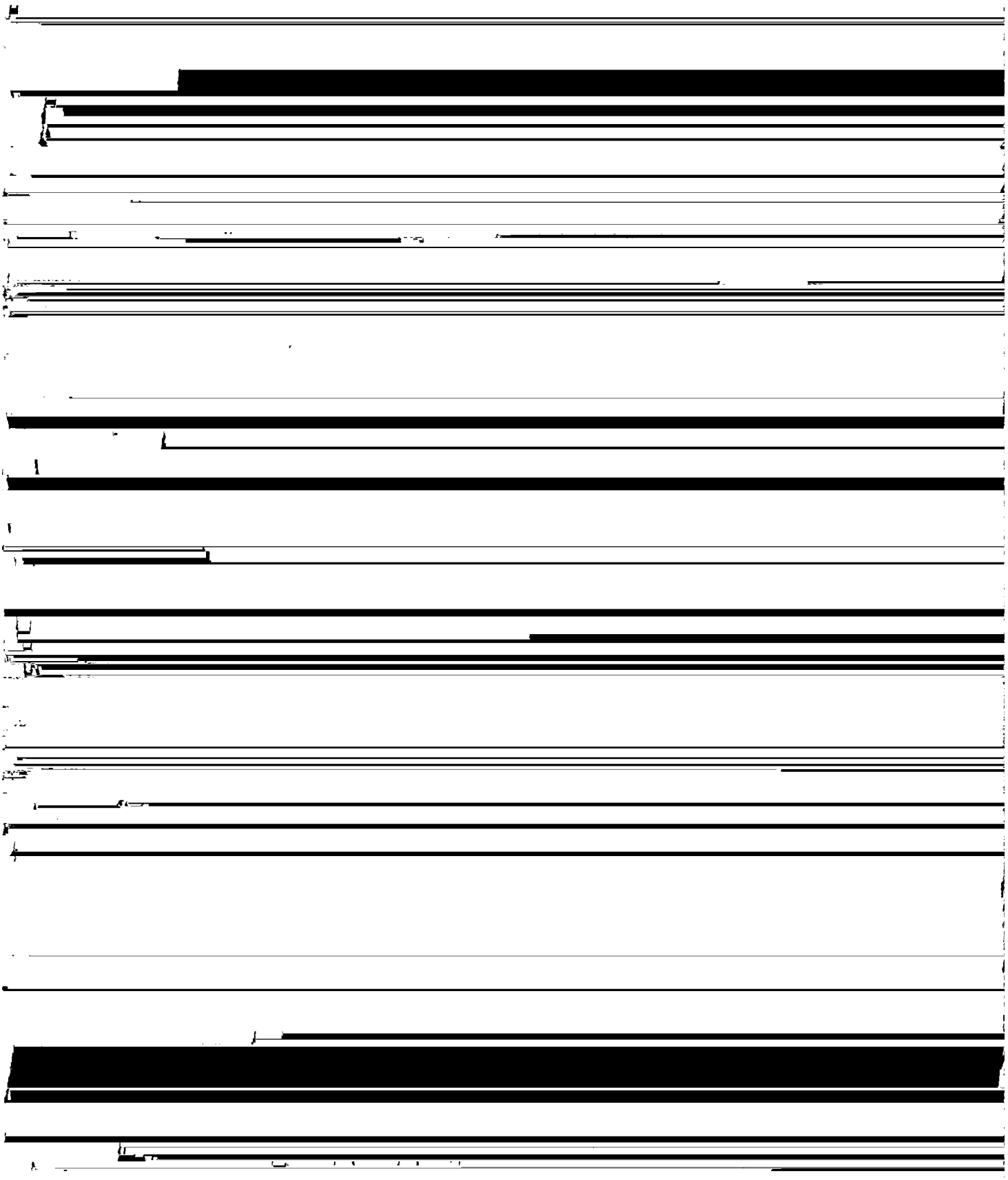
unit IIw-2; Loamy Bottomland range site; pasture and hayland suitability group 2A; windbreaks tree suitability group 3; woodland suitability group 3o4.

Renfrow Series

The Renfrow series consists of deep, well drained, very

soil is well managed. Returning crop residue to the soil

IIC2—45 to 60 inches; very pale brown (10YR 7/3) fine sand; brown



pores and roots; thin coatings of light brownish gray (10YR 6/2) and pale brown (10YR 6/3) silt loam on faces of peds; medium acid; gradual smooth boundary.

B21t—20 to 32 inches; pale brown (10YR 6/3) clay, brown (10YR 5/3) when moist; common fine and medium, prominent and distinct red (2.5YR 5/6), yellowish red (5YR 5/6), strong brown (7.5YR 5/6), yellowish brown (10YR 5/6), and grayish brown (10YR 5/2) mottles; moderate, medium prismatic breaking to moderate, medium subangular blocky structure; very hard, very firm; nearly continuous brown (10YR 5/3) clay films on faces of peds; few vertical faces of peds have thin light brownish gray (10YR 6/2) silt coatings; many fine roots on faces of peds; medium acid; gradual smooth boundary.

B22t—32 to 48 inches; yellowish brown (10YR 5/4) clay; dark yellowish brown (10YR 4/4) when moist; common coarse distinct brown (10YR 4/3), yellowish brown (10YR 5/6), and grayish brown (10YR 5/2) mottles; moderate coarse subangular blocky structure; extremely hard, very firm; dark grayish brown (10YR 4/2) and brown (10YR 4/3) clay films on faces of peds; few soft iron-manganese oxide bodies; moderately alkaline; diffuse smooth boundary.

Included with this soil in mapping are soils that are similar to Seminole loam except that the surface layer is thinner. These soils make up about 10 percent of each mapped area. Also included are Chickasha soils, which make up about 10 percent, and Renfrow soils, which make up about 5 percent.

Most of the acreage of this soil is used for small grains, grain sorghum, annual hay crops, tame pasture grasses, or native grasses. It is also suited to peanuts and soybeans.

The main concerns of management are the hazard of erosion and the fertility and structure of the soil. Where row crops are grown, terraces and contour farming are needed. Large amounts of crop residue can be added to help maintain organic matter content and soil structure and to increase the intake rate of water. Where terraces

brown. It ranges from strongly acid through slightly acid. The B2t horizon is red, reddish brown, light red, yellowish red, or reddish yellow. It is sandy clay loam or fine sandy loam and ranges from strongly acid through medium acid. The B3 horizon, where present, is similar in color, texture, and reaction to the B2t horizon. The C horizon is reddish brown, yellowish red, red, or reddish yellow. Depth to rippable sandstone is 20 to 40 inches.

41—Stephenville fine sandy loam, 1 to 3 percent slopes. This soil is very gently sloping. It has the profile described as representative for the series.

Included with this soil in mapping are Weatherford soils, which make up about 20 percent of each mapped area; Windthorst soils, which make up about 4 percent; and Darnell and Chickasha soils, each of which makes up about 3 percent.

This Stephenville soil is used mostly for tame pasture grasses, native grasses, small grains, or peanuts. It is also suited to grain sorghum and soybeans.

The main concerns of management are the hazard of erosion and the structure and fertility of the soil. Most crops that produce large amounts of residue can be grown continuously if the soil is well manage, crop residue is returned to the soil, and plant food is added. Terraces with protected outlets, contour farming, and minimum tillage are needed where row crops are grown. Capability unit IIe-2; Sandy Savannah range site; pasture and hay-

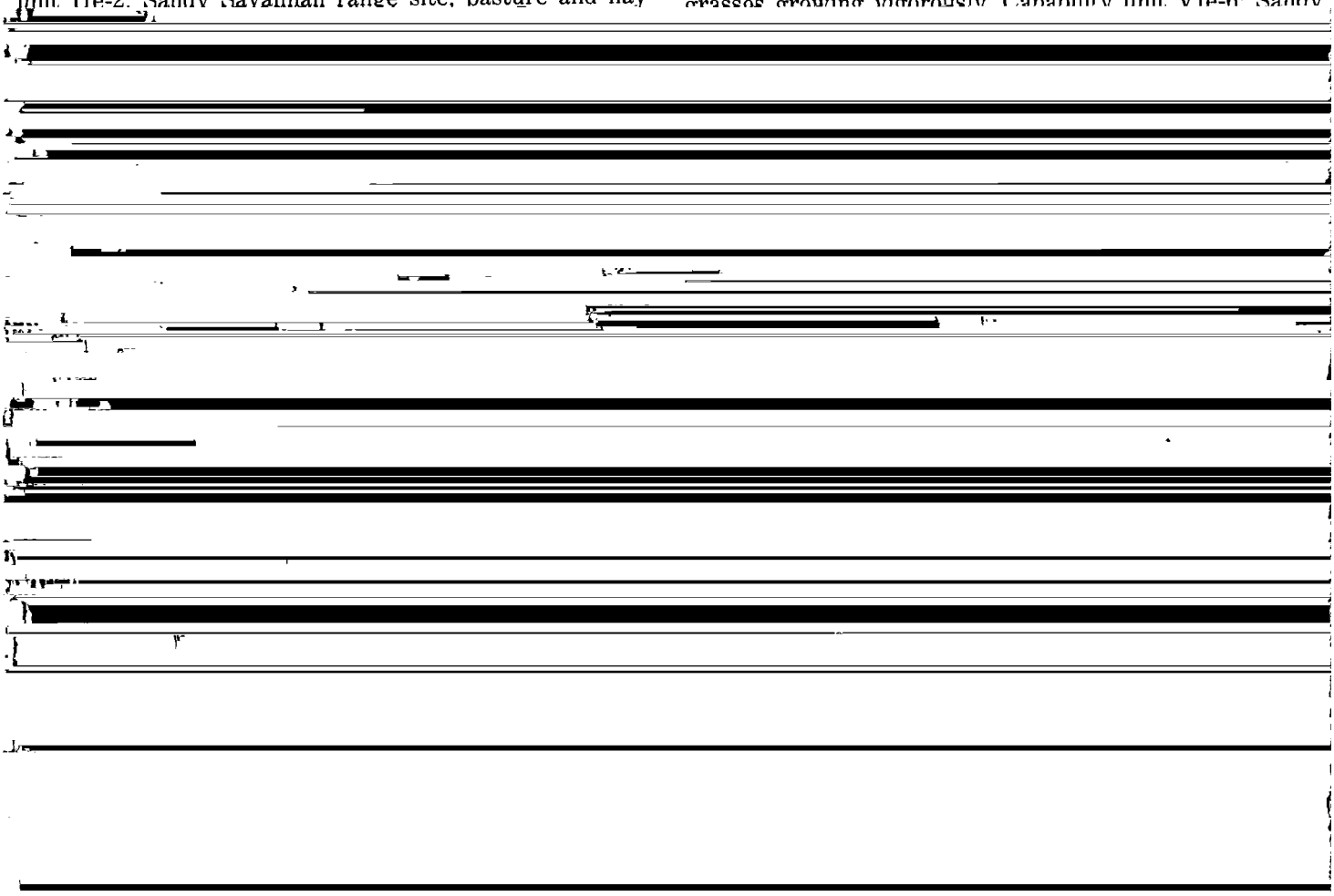
tern that it is impractical to map each kind of soil separately.

Included with these soils in mapping are soils that are similar to Stephenville soil but are underlain by shale or have gray mottles in the subsoil. These similar soils make up about 10 percent of each mapped area. Also included are soils that are similar to Darnell soil except that they are less than 10 inches or are 20 to 40 inches thick to sandstone. Included Windthorst soils make up about 5 percent of each mapped area, and soils that are similar to Windthorst soils but are 20 to 40 inches thick to shale make up about 10 percent. Also included are Weatherford soils, which make up about 10 percent; Noble, Konawa, and Dougherty soils, each of which makes up 3 percent; Eufaula soils, which make up 1 percent; and Vernon soils, which make up only a trace of the total acreage.

About 30 percent of the acreage is Stephenville soil, and about 20 percent is Darnell soil. The Stephenville soil has a profile similar to the one described as representative for its series. The Darnell soil has the profile described as representative for its series (fig. 8).

Stephenville and Darnell soils are used mostly for tame pasture grasses and native grasses or scrubby hardwood trees with a sparce understory of native grasses.

The main concern of management is keeping the grasses growing vigorously. Capability unit VIe-6; Sandy



faces of peds and bridging sand grains; few iron-manganese oxide concretions; medium acid.

The A1 or Ap horizon is reddish brown, grayish brown, or dark brown. It ranges from medium acid through slightly acid. The B1 horizon is reddish brown or brown. It ranges from medium acid through slightly acid. The B2t horizon is red, reddish brown, or yellowish red. It ranges from medium acid through slightly acid. The B3 horizon is red, reddish brown, or yellowish red. It ranges from medium acid through neutral.

44—Teller fine sandy loam, 3 to 5 percent slopes. This soil is gently sloping (fig. 9).

Included with this soil in mapping are soils that are similar to Teller fine sandy loam except that the surface layer is slightly lighter in color. These similar soils make up about 15 percent of each mapped area. Also included are Konawa soils, which make up about 10 percent, and Norge soils, which make up about 5 percent.

This Teller soil is used mostly for tame pasture grasses, small grains, grain sorghum, and peanuts. It is also suited to soybeans and native grasses.

The main concerns of management are the hazard of erosion and the fertility and structure of the soil. Where row crops are grown, terraces and contour farming are needed. Large amounts of crop residue can be returned to the soil and plant food can be added to help maintain organic-matter content, soil fertility, and soil structure and to increase the intake rate of water. Where terraces are not used, a cropping system that includes only soil maintaining crops is needed. Capability unit IIIe-2; Loamy Prairie range site; pasture and hayland suitability group 8A; windbreaks tree suitability group 8; no woodland suitability group.

fine sand and fine sand; saturated with water; moderately alkaline; clear smooth boundary.

Ab—50 to 65 inches; very dark grayish brown (10YR 3/2 when moist) loam; common fine distinct red (2.5YR 5/6) and gray (10YR 5/1) mottles; weak fine granular structure; hard, friable; saturated with water; moderately alkaline.

The A1 horizon is red, reddish brown, or yellowish red. It ranges from medium acid through moderately alkaline. The C horizon is red, reddish brown, light reddish brown, or reddish yellow. It is stratified fine sandy loam, loam, loamy fine sand, or loamy very fine sand and ranges from medium acid through moderately alkaline. The Ab horizon, where present, is very dark grayish brown, dark grayish brown, reddish brown, dark brown, brown, dark reddish gray, or reddish gray when moist. It is stratified loam, fine sandy loam, or clay loam and ranges from neutral through moderately alkaline.

45—Tribbey fine sandy loam. This soil is nearly level through very gently sloping. It is subject to frequent flooding.

Included with this soil in mapping are soils that are similar to Tribbey fine sandy loam except that the water table is near the surface or 4 to 5 feet below the surface most of the year. These similar soils make up about 10 percent of each mapped area.

This Tribbey soil is used mostly for tame pasture grasses, native grasses, or hardwood trees.

The main concerns of management are frequent flooding, fertility of the soil, and overgrazing. Capability unit Vw-2; Wetland range site; pasture and hayland suitability group 2B; windbreaks tree suitability group 1; woodland suitability group 3w4.

Tribbey Series

The Tribbey series consists of deep, somewhat poorly drained, nearly level through very gently sloping soils on flood plains. These soils formed under a cover of hard

Vanoss Series

The Vanoss series consists of deep, well drained, nearly level through very gently sloping soils on uplands. These soils formed under a cover of grass in material weathered from loamy sediment.

In a representative profile the surface layer is 7 inches

hard, friable; clay films on faces of peds; medium acid; clear smooth boundary.

B22t—27 to 37 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) when moist; weak coarse subangular blocky structure; very hard, friable; clay films on faces of peds; medium acid; clear smooth boundary.

B3—37 to 50 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) when moist; weak coarse subangular blocky structure; hard, friable; clay films on faces of peds; medium acid; gradual smooth boundary.

C—50 to 95 inches; pale brown (10YR 6/3) loam, many medium faint grayish brown (10YR 5/2), brown (10YR 5/3), and yellowish brown mottles; massive; hard, friable; medium acid.

The A1 or Ap horizon is grayish brown, dark grayish brown, or brown. It ranges from strongly acid through slightly acid. The B1 horizon is brown, dark grayish brown, or dark brown. It is loam, clay loam, or silt loam and ranges from medium acid through slightly acid. The B2t horizon is dark yellowish brown, yellowish brown, or brown. It is clay loam or silty clay loam and ranges from medium acid through slightly acid. The B3 horizon is yellowish brown, strong brown, or brown. It is clay loam, silt loam, or loam and ranges from medium acid through neutral. The C horizon is pale brown, yellowish brown, or strong brown. It is loam, fine sandy loam, or clay loam and ranges from medium acid through neutral.

46—Vanoss loam, 0 to 1 percent slopes. This is a nearly level soil. It has the profile described as representative for the series.

Included with this soil in mapping are soils that are similar to Vanoss loam except that the combined thickness of the surface layer and the next layer is more than 20 inches. These similar soils make up about 10 percent of each mapped area. Also included are Galey and Teller soils, each of which makes up about 3 percent, and Konawa and Norge soils, each of which makes up about 2 percent.

This Vanoss soil is used mostly for small grains, alfalfa hay, peanuts, and grain sorghum. It is also suited to soybeans, tame pasture grasses, and native grasses.

The main concerns of management are the structure and fertility of the soil. Large amounts of residue can be

The main concerns of management are the hazard of erosion and the structure and fertility of the soil. Most adapted crops can be grown if this soil is well managed. Returning crop residue to the soil and adding plant food are good management practices. Terraces with protected outlets, contour farming, and minimum tillage are needed where row crops are grown. Capability unit IIe-1; Loamy Prairie rane site; pasture and hayland suitability group 8A; windbreaks tree suitability group 8; no woodland suitability group.

Vernon Series

The Vernon series consists of deep, well drained, gently sloping through strongly sloping soils on uplands. These soils formed under a cover of grass in material weathered from shale or clayey sediment.

In a representative profile the surface layer is 5 inches of reddish brown clay. The subsoil, to a depth of 30 inches, is reddish brown clay. The underlying material to a depth of 60 inches is red clay.

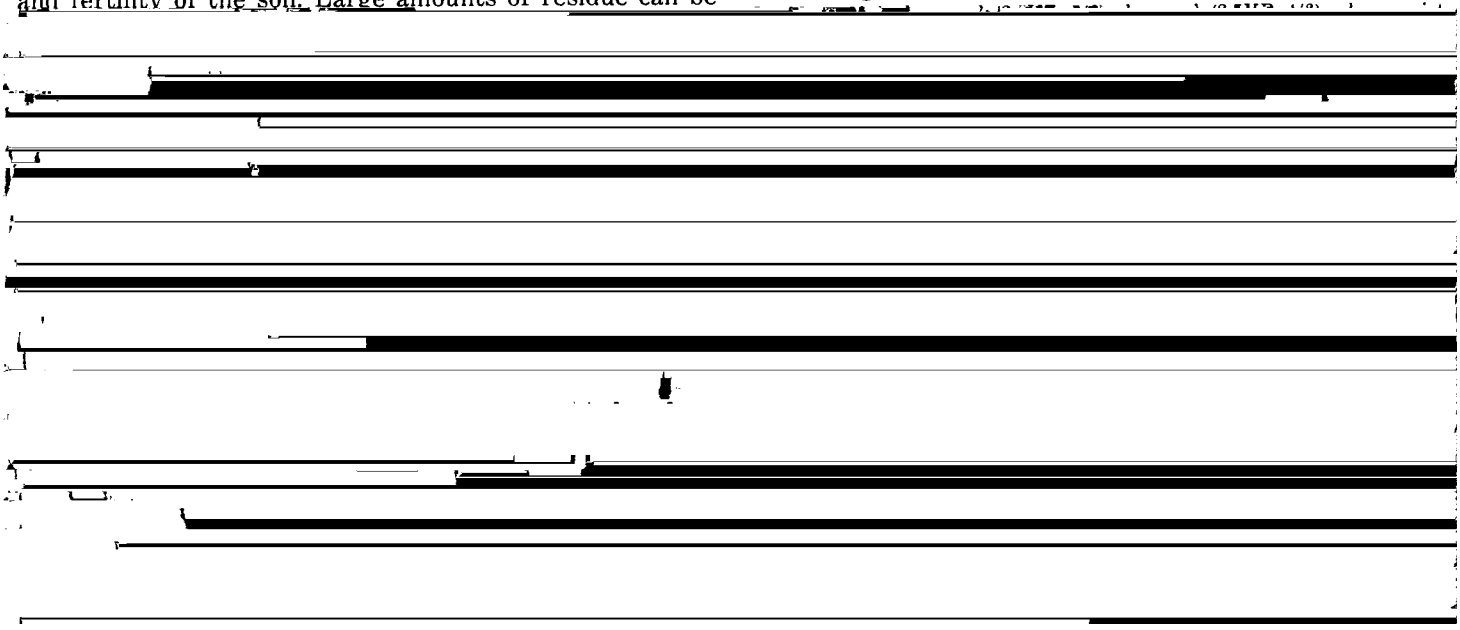
Vernon soils have very slow permeability. Available water capacity is moderate.

Representative profile of Vernon clay, 5 to 12 percent slopes, about 50 feet east and 50 feet north of the southwest corner of section 9, T. 8 N., R. 4 E.:

A1—0 to 5 inches; reddish brown (2.5YR 4/4) clay, dark reddish brown (2.5YR 3/4) when moist; moderate medium granular structure; extremely hard, very firm; calcareous; moderately alkaline; gradual smooth boundary.

B2—5 to 12 inches; reddish brown (2.5YR 5/4) clay, reddish brown (2.5YR 4/4) when moist; moderate medium and fine blocky structure; extremely hard, very firm; few fine spots of soft calcium carbonate; calcareous; moderately alkaline; gradual smooth boundary.

B3—12 to 30 inches; reddish brown (2.5YR 5/4) clay, reddish brown (2.5YR 4/4) when moist; weak medium and fine blocky structure; extremely hard, very firm; few slickensides; common fine and medium spots of soft calcium carbonates; calcareous; moderately alkaline; gradual smooth boundary.



the soil and using plant food are good management practices. Terraces with protected outlets, contour farming, and minimum tillage are needed where this soil is used for row crops. Where terraces are not used, a cropping system that includes only soil maintaining crops is needed. Capability unit IVe-1; Red Clay Prairie range site; pasture and hayland suitability group 7A; windbreaks tree suitability group 9; no woodland suitability group.

49—Vernon clay, 5 to 12 percent slopes. This soil is sloping through strongly sloping. It has the profile described as representative for the series.

Included with this soil in mapping are soils that are similar to Vernon clay except that the surface layer and the upper part of the subsoil are slightly darker. These similar soils make up about 15 percent of each mapped area. Also included are Zaneis soils, which make up about 10 percent; Renfrow soils, which make up 7 percent; Darnell soils and soils that are similar to Darnell soils but are less than 10 inches thick over sandstone, each of which makes up about 5 percent; and soils that are similar to Teller soils but are 20 to 40 inches thick over shale or claybeds, which make up 3 percent.

This Vernon soil is used mostly for native grasses. The main concern of management is keeping the grasses growing vigorously. Capability unit VIe-2; Red Clay Prairie range site; pasture and hayland suitability group 7A; windbreaks tree suitability group 9; no woodland suitability group.

50—Vernon-Port complex. These are nearly level through strongly sloping soils. Vernon and Port soils are in such an intricate pattern that it is impractical to map each kind of soil separately. Port soils are frequently flooded.

Included with these soils in mapping are Aydelotte soils and soils that are similar to Aydelotte soils but are less than 60 inches thick over shale, each of which makes up about 10 percent of each mapped area; Zaneis soils and soils that are similar to Zaneis soils but are 20 to 40 inches thick over rock, which make up, respectively, 7 and 5 percent; Renfrow soils, which make up 5 percent; Chickasha soils and soils that are similar to Chickasha soils but are 20 to 40 inches thick over rock, each of

tomland range site for Port soils; pasture and hayland suitability goup 7A for Vernon soils and 2A for Port soils; windbreaks tree suitability group 9; woodland suitability group for Port soils 3o4, no woodland suitability group for Vernon soils.

Weatherford Series

The Weatherford series consists of deep, well drained, very gently sloping through sloping soils on uplands. These soils are formed under a cover of hardwood forest and grass in material weathered from sandstone.

In a representative profile the surface layer is 5 inches of brown fine sandy loam. The subsurface layer, to a depth of 12 inches, is brown fine sandy loam. The subsoil, to a depth of 52 inches, is red and light red sandy clay loam. It is underlain by dark reddish brown sandstone to a depth of 60 inches.

Weatherford soils have moderate permeability. Available water capacity is high.

Representative profile of Weatherford fine sandy loam, 1 to 3 percent slopes, about 100 feet east and 135 feet north of the southwest corner of section 29, T. 10 N., R. 2 E.:

A1—0 to 5 inches; brown (7.5YR 5/2) fine sandy loam, dark brown (7.5YR 3/2) when moist; weak fine granular structure; slightly hard, very friable; slightly acid; clear smooth boundary.

A2—5 to 12 inches; brown (7.5YR 5/3) fine sandy loam, brown (7.5YR 4/3) when moist; weak fine granular structure; slightly hard, very friable; neutral; abrupt smooth boundary.

B21t—12 to 18 inches; red (2.5YR 5/6) sandy clay loam, red (2.5YR 4/6) when moist; moderate medium subangular blocky structure; very hard, friable; clay films bridging sand grains and on faces of peds; medium acid; gradual smooth boundary.

B22t—18 to 30 inches; red (2.5YR 5/6) sandy clay loam, red (2.5YR 4/6) when moist; moderate medium and fine subangular blocky structure; very hard, friable; clay films bridging sand grains and on faces of peds; medium acid; gradual smooth boundary.

B23t—30 to 52 inches; light red, (2.5YR 6/6) sandy clay loam, red (2.5YR 5/6) when moist; common bodies of red (2.5YR 5/6) when moist; weak coarse subangular blocky structure; very hard, friable; clay bridging sand grains and on faces of peds; medium acid; clear smooth boundary.

C—52 to 60 inches; dark reddish brown (2.5YR 3/4) sandstone; hard and massive; soft and friable when moist.

The A1 or Ap horizon is brown, light brownish gray, grayish brown,

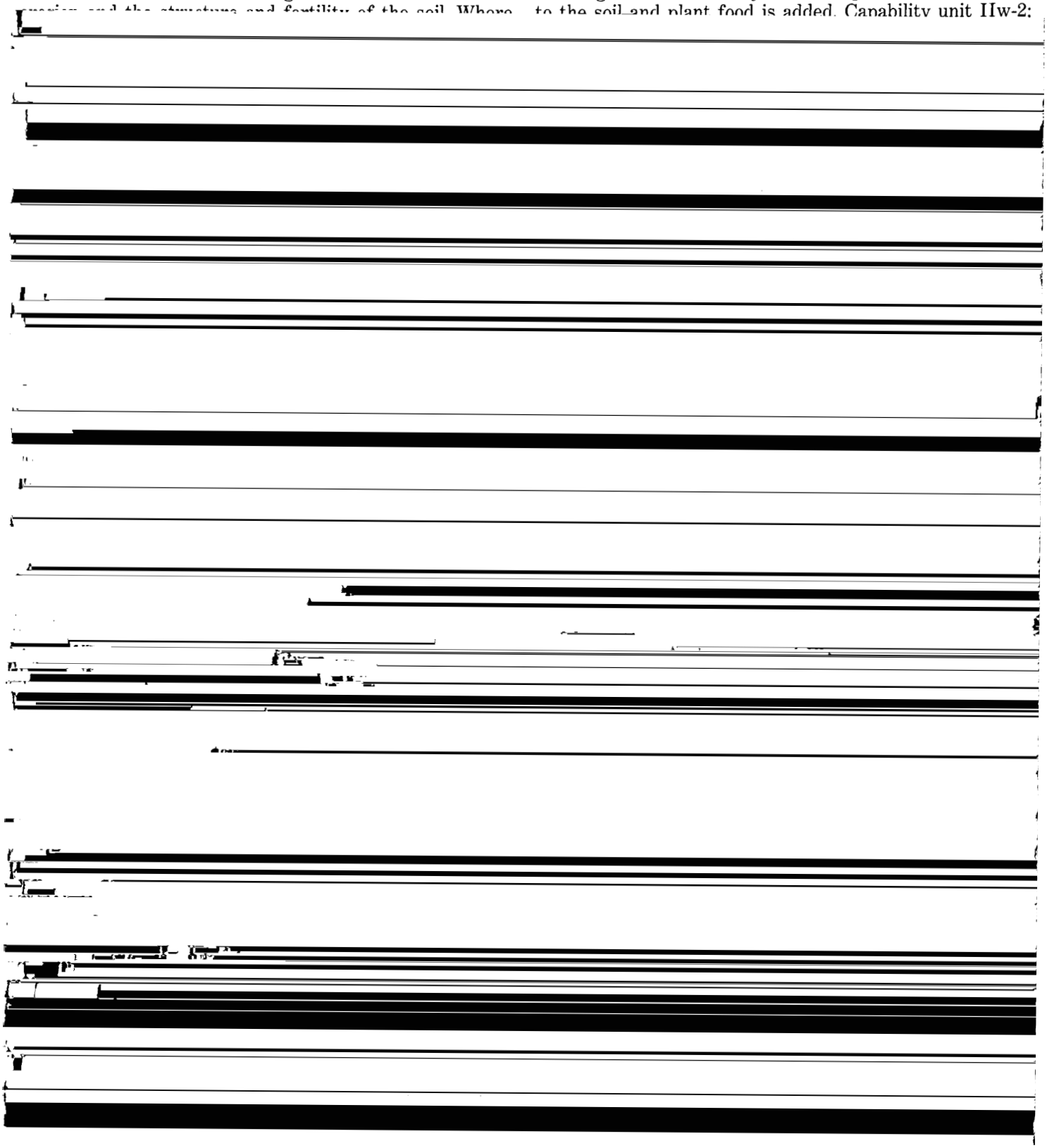
up 1 percent. Also included are soils that are similar to [illegible] at a depth of 40 to 60

Weatherford and Stephenville soils are used mostly for tame pasture grasses and native grasses

This Windthorst soil is used mostly for tame pasture grasses, native grasses, and small grains. It is also suited to grain sorghums, soybeans, and peanuts.

The main concerns of management are the hazard of [illegible] and the structure and fertility of the soil. Where

The main concerns of management are occasional flooding and the structure and fertility of the soil. Most crops grown on this soil produce large amounts of residue and can be grown continuously where crop residue is returned to the soil and plant food is added. Capability unit IIw-2;



cent of each mapped area. Also included are Renfrew During a soil survey soil scientists conservationists en-

Where soils are to be cropped, they must be worked to prepare a seedbed, to control weeds, and to provide a place for the growth of plant roots. Excessive tillage

ment produce more forage than common bermudagrass. Bermudagrass is well suited to most Class I through VII soils. Winter rye and vetch, when overseeded on bermu-

The predicted yields are based mainly on the ex-

Extension agents. Results of field trials and demonstrations and available yield data from nearby counties were also considered.

The latest soil and crop management practices used by many farmers in the county are assumed in predicting the yields. Pasture yields are predicted for one grass variety suited to the soil. A few farmers may be using more advanced practices and are obtaining average yields higher than those shown in table 5.

The management needed to achieve the indicated yields of the various crops depends upon the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is favorable; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residues, barnyard manure, and green-manure crops; harvesting crops with the smallest possible loss; and timeliness of all fieldwork.

The predicted yields reflect the relative productive capacity of the soils for each of the principal crops. Yields are likely to increase in the future as new production technology is developed. The relative productivity of a given soil compared to other soils, however, is not likely to change.

stitute for interpretations designed to show suitability

gineering.

In the capability system, all kinds of soil are grouped at three levels: the class, the subclass, and the unit.

CAPABILITY CLASSES, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. In class I are soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, so shallow, or otherwise so limited that they do not produce worthwhile yields of crops, forage, or wood products.

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly beause it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry. There is no subclass *c* in Pottawatomie County.

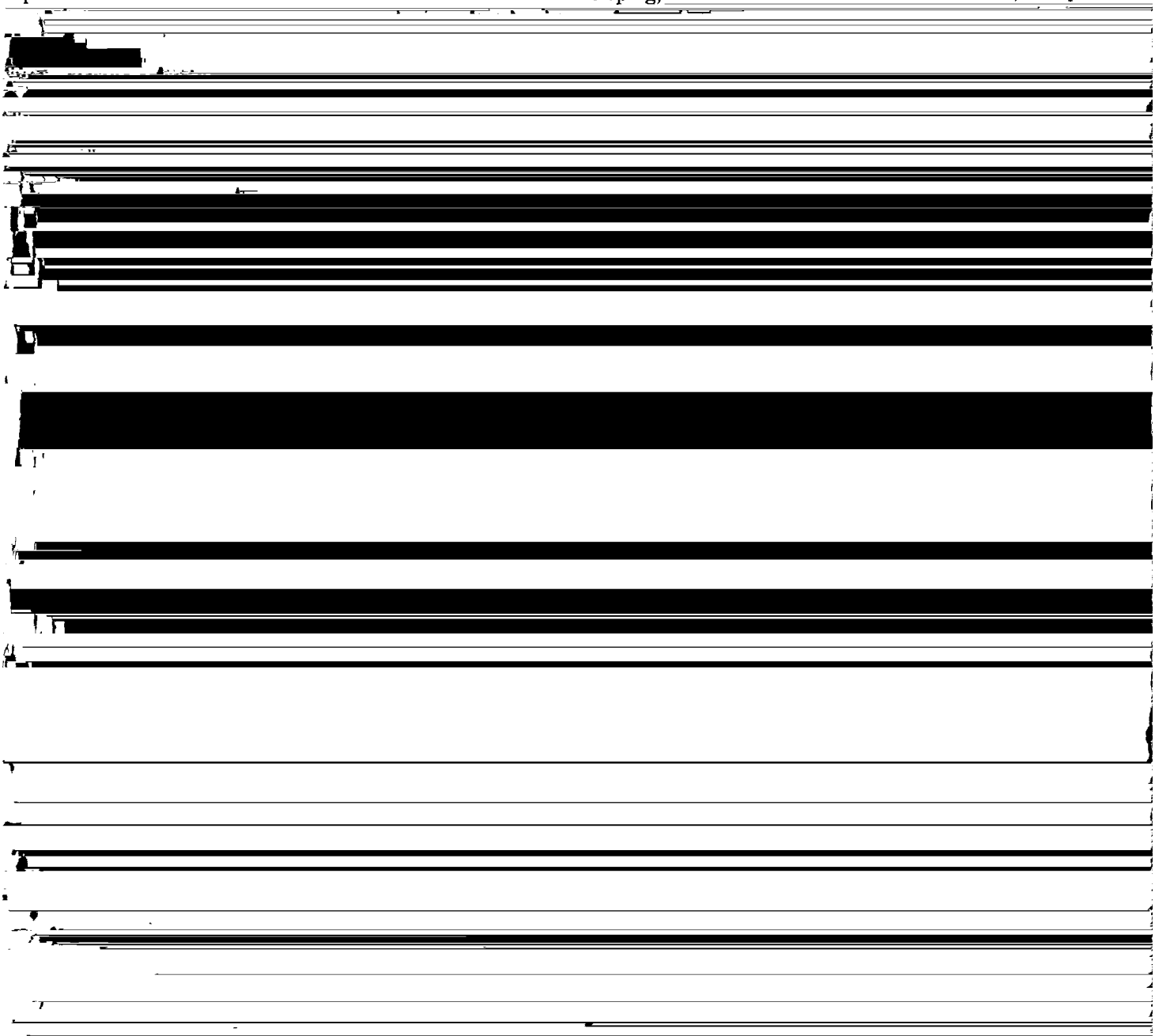
In class I there are no subclasses because the soils of this class have few limitations. Class V can contain, at the

Unit I-1. Deep, nearly level, well drained silt loam soils; on flood plains.

Unit I-2. Deep, nearly level, well drained loam soils; on uplands.

Unit IVe-1. Deep, gently sloping, well drained clay loam soils; on uplands.

Unit IVe-2. Deep, very gently sloping through gently sloping, well drained loam and silt loam soils; on uplands.



the choice of plants or that require moderate conservation practices.

Subclass IIe. Soils subject to moderate erosion if not protected.

Unit IIe-1. Deep, nearly level through very gently sloping, moderately well drained and well drained loam soils; on uplands.

Unit IIe-2. Deep and moderately deep, nearly level through very gently sloping, moderately well drained and well drained fine sandy loam soils; on uplands.

Subclass IIw. Soils having moderate limitations because

drained fine sandy loam soils; on uplands.

Unit IVe-4. Deep, gently sloping through sloping, well drained loamy fine sand soils; on uplands.

Subclass IVs. Soils having very severe limitations because of soil features.

Unit IVs-1. Deep, nearly level through very gently sloping, somewhat excessively drained loamy fine sand soils; on flood plains.

Unit IVs-2. Deep, nearly level through very gently sloping, somewhat excessively drained fine sand soils; on

Class VII. Soils having very severe limitations that make them unsuited to cultivation and that restrict their use largely to range, woodland, or wildlife.

Subclass VIIe. Soils very severely limited, chiefly by risk of erosion, unless protective cover is maintained.

Unit VIIe-1. Borrow pits with subsoil and underlying material exposed at the surface; on uplands.

Unit VIIe-2. Gravel pits with subsoil and underlying material exposed at the surface; on uplands.

Subclass VIIw. Soils very severely limited, chiefly by ponded water on the surface.

Unit VIIw-1. Deep, nearly level, poorly drained clay

productive combination of forage plants on a range site is generally the climax vegetation.

Decreasers are plants in the climax vegetation that tend to decrease in relative amount under close grazing. They generally are the tallest and most productive perennial grasses and forbs and the most palatable to livestock.

Increasers are plants in the climax vegetation that increase in relative amount as the more desirable decreaser plants are reduced by close grazing. They are commonly shorter than decreasers and are generally less palatable to livestock.

is an estimate of the potential annual yield of air-dry herbage for each site when it is in excellent condition (see table 6).

Table 6 shows, for each kind of soil, the name of the range site, the potential annual production of herbage in favorable, normal, and unfavorable years, and the names of major plant species and the percentage of each in the composition of the potential plant community.

A range site supports a distinctive potential plant community, or combination of plants, that can grow on a site that has not undergone major disturbance. Soils that produce the same kind, amount, and proportion of range plants are grouped into range sites. Range sites can be interpreted directly from the soil map where the relationships between soils and vegetation have been correlated. Properties that determine the capacity of the soil to supply moisture and plant nutrients have the greatest influence on range plants and their productivity. Soil reaction, salt content, and a seasonal high water table are also important.

Potential production refers to the amount of herbage that can be expected to grow on well-managed range that is supporting the potential plant community. It is expressed in pounds per acre of air-dry herbage for favorable, normal, and unfavorable years. A favorable year is one in which the amount and distribution of precipitation and the temperatures result in growing conditions substantially better than average; a normal year is one in which these conditions are about average for the area; an unfavorable year is one in which growing conditions are well below average, generally because of low available soil moisture.

Dry weight refers to the total air-dry herbage produced per acre each year by the potential plant community. All herbage, both that which is highly palatable and that which is unpalatable to livestock, is included. Some of the herbage also may be grazed extensively by wildlife, and some of it may not. Plant species that have special value for livestock forage are mentioned in the description of each range site.

Common names are listed for the grasses, forbs, and shrubs that make up most of the potential plant community on each soil. Under the heading "Composition" in table 5, the proportion of each species is presented as the percentage, in dry-weight, of the total annual production of herbaceous and woody plants. The amount that can be used as forage depends on the kinds of grazing animals and on the season when the forage is grazed. Not all of the herbage produced is normally used.

Range management requires, in addition to knowledge of the kind of soil and the potential plant community, an evaluation of the present condition of the range vegetation in relation to its potential production. Range condition is a comparison of the present plant community with the potential plant community on a particular kind of soil and range site. The more nearly alike the present kinds and amounts of plants and the potential plant community, the better the range condition. The usual objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential native plant community for that site. Such management generally results in the maximum production of herbage, conservation of water, and control of erosion. Sometimes, however, a range condition somewhat below the potential fits grazing needs, provides wildlife habitat, or provides other benefits as well as protecting soil and water resources.

Specific information about stocking range sites is not included in this publication. Help in classifying range sites, in estimating the condition of the range, and in determining the number of animals to stock can be obtained from technicians of the local agricultural agencies.

Claypan Prairie Range Site. This site consists of deep nearly level through gently sloping, loamy soils that have a clayey or loamy subsoil. These soils are on uplands.

Under continuous intensive grazing by cattle, little bluestem, big bluestem, switchgrass, indiangrass, leadplant, and Illinois bundleflower decrease in the plant community. Side-oats grama, blue grama, tall dropseed, goldenrod and shrubs increase. If overgrazing is allowed to continue for a long time, threeawns, silver bluestem, buffalograss, broomsedge bluestem, ragweeds, bitter sneezeweed, common broomweed, and woody plants replace many of the more desirable forage plants and make up a substantial part of the annual growth. Then, the total production of forage is greatly reduced.

Appropriate management practices on this site consist of regulating grazing, following a planned system of grazing, controlling weeds and brush, seeding desirable range plants, and developing well distributed and adequate supplies of water for livestock.

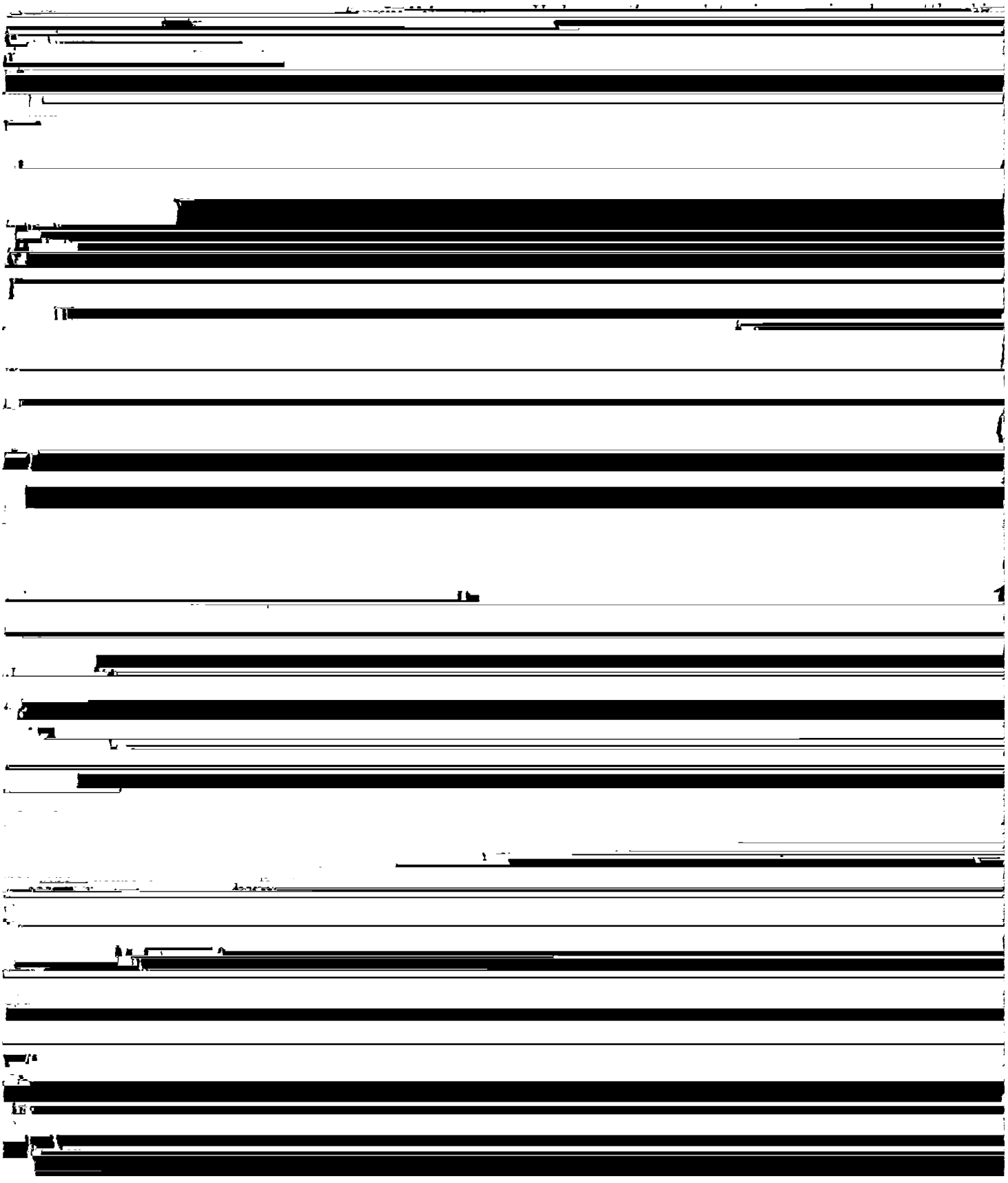
Deep Sand Savannah Range Site. This site consists of deep, nearly level through strongly sloping, sandy soils that have a sandy or loamy subsoil. These soils are on uplands.

Under continuous intensive grazing by cattle, little bluestem, big bluestem, indiangrass, switchgrass, and perennial forbs decrease in the plant community. Tall dropseed, purpletop, Scribner panicum, and oaks increase. If overgrazing is allowed to continue for a long time, broomsedge bluestem, splitbeard bluestem, low-growing panicums, ragweeds, camphorweed, annuals, and oaks replace many of the more desirable forage plants and make up a substantial part of the annual growth. Then, the total production of forage is greatly reduced.

Appropriate management practices on this site consist of regulating grazing, following a planned system of grazing and deferred grazing, seeding desirable range plants, controlling brush and weeds, and developing well distributed and adequate supplies of water for livestock.

Eroded Clay Range Site. This site consists of deep, gently sloping through sloping, severely eroded, loamy soils that have a clayey and loamy subsoil. These soils are on uplands.

Under continuous intensive grazing by cattle, indiangrass, little bluestem, side-oats grama, and perennial sun-



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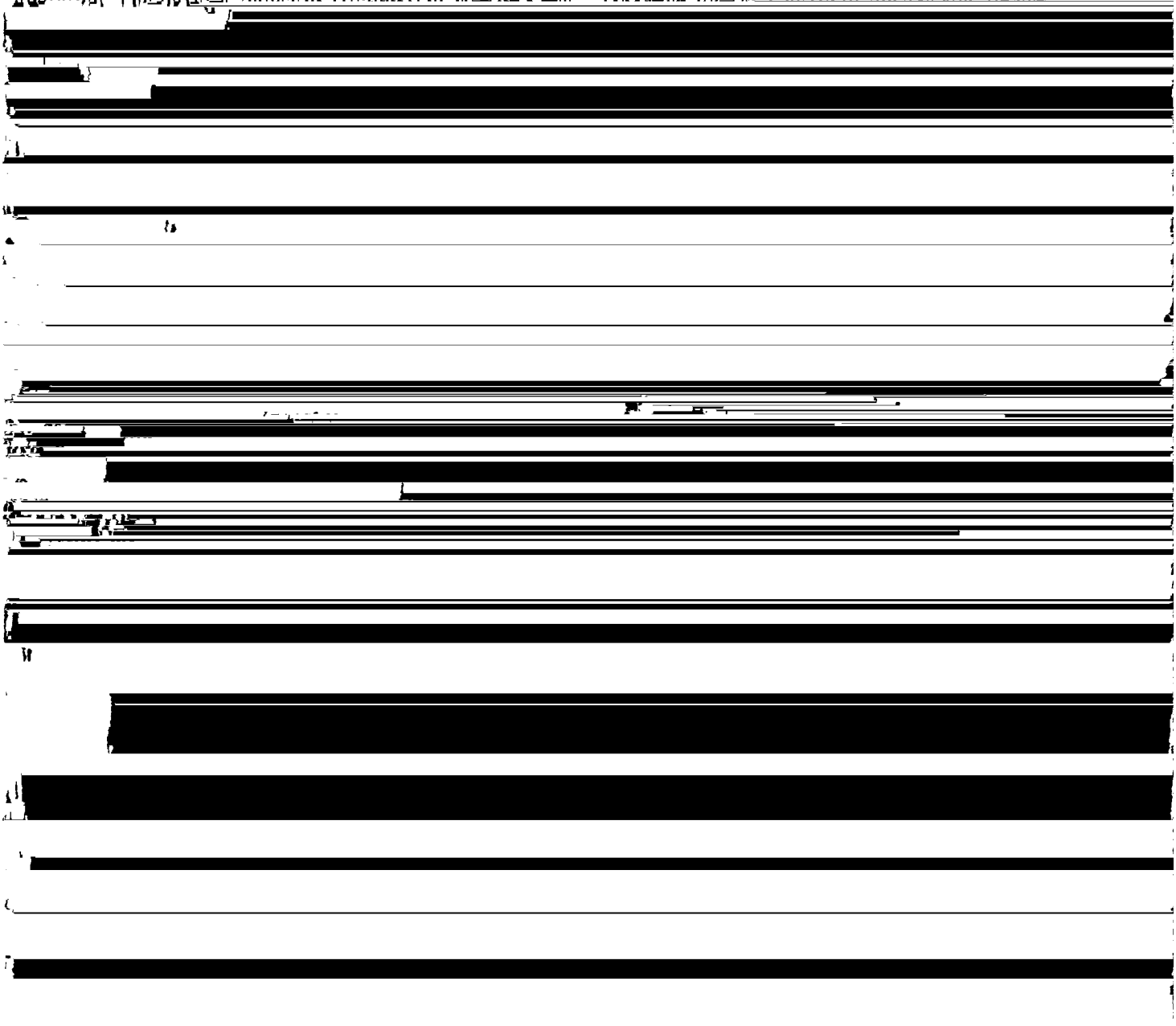
Woodland Management and Productivity

Table 7 contains information useful to woodland owners or forest managers planning use of soils for wood crops. Mapping unit symbols for those soils suitable for wood crops are listed in numerical order, and the woodland suitability group for each soil is given. All soils in each group require the same general kinds of woodland management and have about the same potential productivity.

The first part of the symbol, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter r indicates stoniness or rockiness; w

ficient rainfall. A rating of *slight* indicates that the expected mortality of the planted seedlings is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of plant competition indicate the degree to which undesirable plants are expected to invade or grow if openings are made in the tree canopy. The invading plants compete with native plants or planted seedlings by impeding or preventing their growth. A rating of *slight* indicates little or no competition from other plants; *moderate* indicates that plant competition is expected to hinder the development of a fully stocked stand of desirable trees; *severe* means that plant competition is expected to prevent the establishment of a desirable stand unless the site is intensively prepared, weeded, or otherwise managed for the control of undesirable plants.



Windbreaks are established to protect livestock, buildings, and yards from winds and snow. Windbreaks also help protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of both broad-leaved and coniferous species provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field, the interval depending on erodibility of the soil. They protect cropland and crops from wind and hold snow on the fields, and they also provide food and cover for wildlife.

Environmental plantings help to beautify and screen homes and other buildings and to abate noise around them. The plants, mostly evergreen shrubs and trees, are closely spaced. Healthy planting stock of suitable species planted properly on a well prepared site and maintained

Young trees need considerable care if they are to survive and do well on most of the soils of Pottawatomie County. With limited and irregular rainfall, weeds must be controlled so they do not compete with the seedlings for moisture. Trees must be protected from livestock and fire. Additional information on the appropriate design for the desired purpose and on the planting and care of tree plantings is available from the Soil Conservation Service and the State Forester and Extension Forester serving the county.

The kind of soil and the soil-air-moisture relationship greatly influence the growth of trees in this area. Trees normally grow best on deep, loamy soils. Only fair to poor growth is made on clayey soils because they absorb and release moisture too slowly. Deep soils are better suited to trees [illegible] than are shallow soils because more

are principal hazards to seedling establishment. Some seedling mortality can be expected where these soils are subject to prolonged flooding.

Estimated tree heights, in feet, at age 20 are 60 for eastern cottonwood and 27 for eastern redcedar.

Trees and shrubs suitable for planting are: broadleafs—eastern cottonwood, American sycamore, osageorange; shrubs—Chickasaw plum; conifers are not suited.

Windbreaks Tree Suitability Group 3. This group consists of deep, moderately coarse textured, well drained soils on nearly level through very gently sloping flood plains. Moisture competition from weeds and grasses is the principal hazard to tree establishment. On areas subject to prolonged inundation, some mortality can be expected in new tree plantings.

Estimated tree heights, in feet, at age 20 are 65 for eastern cottonwood, 30 for eastern redcedar, and 40 for loblolly pine.

Trees and shrubs suitable for planting are: conifers—eastern redcedar, Austrian pine, loblolly pine; broadleafs—eastern cottonwood, American sycamore, pecan, Chinese pistache, Russian mulberry, osageorange, eastern redbud; shrubs—autumn-olive, Chickasaw plum, smooth sumac. The conifers listed as suitable for planting should not be planted in areas of prolonged flooding.

Windbreaks Tree Suitability Group 4. This group consists of deep; moderately fine textured, medium textured, and moderately coarse textured; well drained and moderately well drained soils on nearly level through very gently sloping flood plains. Minor areas of steeper soils slopes are also in this group. Moisture competition from weeds and grasses are principal hazards to tree establishment.

Estimated tree heights, in feet, at age 20 are 75 for eastern cottonwood, 55 for green ash, 35 for eastern redcedar, 35 for Austrian pine, and 45 for loblolly pine.

Trees and shrubs suitable for planting are: conifers—eastern redcedar, Austrian pine, loblolly pine, Scotch pine, Japanese black pine; broadleafs—eastern cottonwood, green ash, hackberry, American sycamore, bur oak, pecan, black walnut, osageorange, Russian mulberry, eastern redbud, Shumard oak, baldcypress, sweetgum, sugar maple, flowering dogwood; shrubs—autumn-olive, lilac, Chickasaw plum. The conifers listed as suitable for planting can be killed if the soil is inundated during seedling stage.

Windbreaks Tree Suitability Group 5. This group consists of deep, fine textured and moderately fine textured, somewhat poorly drained and moderately well drained soils on nearly level flood plains. Periodic soil droughtiness and moisture competition from weeds and grasses are the principal hazards to tree establishment.

Estimated tree heights, in feet, at age 20 are 60 for eastern cottonwood and 40 for green ash.

Trees and shrubs suitable for planting are: broadleafs—cottonwood, green ash, pecan, Shumard oak, hackberry, Kentucky coffeetree, bur oak, Russian mulberry, osageorange, thornless honeylocust, eastern redbud; shrubs—lilac; conifers are not suited.

Windbreaks Tree Suitability Group 6. This group consists of deep, medium textured and moderately coarse textured, well drained and moderately well drained soils on nearly level through gently sloping uplands. Soil droughtiness and competition from weeds and grasses are the principal hazards to tree establishment.

Estimated tree heights, in feet, at age 20 are 30 for eastern redcedar and 20 for osageorange.

Trees and shrubs suitable for planting are: conifers—eastern redcedar; broadleafs—osageorange, thornless honeylocust, hackberry, Russian mulberry, eastern redbud; shrubs—lilac.

Windbreaks Tree Suitability Group 7. This group consists of deep, coarse textured, somewhat excessively drained soils on nearly level through sloping uplands Periodic droughtiness and blowing sand are principal hazards to seedling establishment during most years.

Estimated tree height, in feet, at age 20 is 22 for eastern redcedar.

Trees and shrubs suitable for planting are: conifers—eastern redcedar, Scotch pine; broadleafs—black locust, osageorange; shrubs—Chickasaw plum, Russian-olive.

Windbreaks tree Suitability Group 8. This group consists of deep, moderately deep, and shallow; medium textured, moderately coarse textured, and coarse textured; well drained, moderately well drained, and somewhat excessively drained soils on nearly level through strongly sloping uplands. Competition from weeds and grasses is the principal hazard to tree establishment. Droughtiness and blowing sand are hazards to tree establishment on Dougherty and Konawa loamy fine sands.

Estimated tree heights, in feet, at age 20 are 30 for eastern redcedar, 30 for Austrian pine, 40 for loblolly pine, and 35 for shortleaf pine.

Trees and shrubs suitable for planting are: conifers—eastern redcedar, Austrian pine, loblolly pine, Scotch pine, Japanese black pine; broadleafs—eastern cottonwood, green ash, hackberry, sycamore, bur oak, pecan, black walnut, osageorange, Russian mulberry, eastern redbud, Shumard oak, sweetgum, sugar maple, roughleaf dogwood; shrubs—autumn-olive, lilac, Chickasaw plum.

Windbreaks Tree Suitability Group 9. This group consists of deep; moderately fine textured, fine textured, and medium textured; well drained and poorly drained soils on nearly level through strongly sloping uplands. Borrow Pits and Gravel Pits are in this group. Inadequate rooting depth, extreme droughtiness, and the alkali subsoil make these soils generally unsuitable for tree plantings.

Engineering

FORREST MCCLUNG, engineer, Soil Conservation Service, assisted in the preparation of this section.

This section provides information about the use of soils for building sites, sanitary facilities, construction materi-

als, and water management. Among those who can benefit from this section are engineers, landowners, community decision makers and planners, town and city managers, land developers, builders, contractors, and farmers and ranchers.

The ratings in tables in this section are based on test data and estimated data in the "Soil Properties" section. The ratings were determined jointly by soil scientists and engineers of the Soil Conservation Service using known relationships between the soil properties and the behavior of soils in various engineering uses.

Among the soil properties and site conditions identified by the soil survey and used in determining the ratings in this section are grain-size distribution, liquid limit, plasticity index, soil reaction, depth to and hardness of bedrock within 5 or 6 feet of the surface, soil wetness characteristics, depth to a seasonal water table, slope, likelihood of flooding, natural soil structure or aggregation, in-place soil density, and geologic origin of the soil material. Where pertinent, data about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations were also considered.

Based on the information assembled about soil properties, ranges of values may be estimated for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, shear strength, compressibility, slope stability, and other factors of expected soil behavior in engineering uses. As appropriate, these values may be applied to each major horizon of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to—(1) select potential residential, commercial, industrial, and recreational areas; (2) make preliminary estimates pertinent to construction in a particular area; (3) evaluate alternate routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternate sites for location of sanitary landfills, onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils and geology; (6) find sources of gravel, sand, clay, and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar struc-

First, the data are generally not presented for soil material below a depth of 5 or 6 feet. Also, because of the scale of the detailed map in this soil survey, small areas of soils that differ from the dominant soil may be included in mapping. Thus, these data do not eliminate the need for onsite investigations and testing.

The information is presented mainly in tables. Table 9 shows, for each kind of soil, ratings of the degree and kind of limitations for building site development; table 10, for sanitary facilities; and table 12, for water management. Table 11 shows the suitability of each kind of soil as a source of construction materials.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey can be used to make additional interpretations and to construct interpretive maps for specific uses of land.

Some of the terms used in this soil survey have different meanings in soil science and in engineering; many of these terms are defined in the Glossary.

Building site development

The degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets are indicated in table 9. A *slight* limitation indicates that soil properties are favorable for the specified use; any limitation is minor and easily overcome. A *moderate* limitation indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design. A *severe* limitation indicates one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required. For some soils rated severe, such costly measures may not be feasible.

Shallow excavations are used for pipelines, sewerlines, telephone and power transmission lines, basements, open ditches, and cemeteries. Such digging or trenching is influenced by the wetness caused by a high seasonal water table, the texture and consistence of soils, the tendency of soils to cave in or slough, and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by slope of the soil and the probability of flooding. Ratings do not apply to soil horizons below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is defined, and the presence of very firm or

shear failure of the foundation do not occur. These ratings were determined from estimates of the shear strength, compressibility, and shrink-swell potential of the soil. Soil texture, plasticity and in-place density, potential frost action, soil wetness, and depth to a seasonal high water table were also considered. Soil wetness and depth to a seasonal high water table indicate potential difficulty in providing adequate drainage for basements, lawns, and gardens. Depth to bedrock, slope, and the large stones in or on the soil are also important considerations in the choice of sites for these structures and were considered in determining the ratings. Susceptibility to flooding is a serious limitation.

Local roads and streets referred to in table 9 have an all-weather surface that can carry light to medium traffic all year. They consist of subgrade of the underlying soil material; a base of gravel, crushed rock fragments, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. The roads are graded with soil material at hand, and most cuts and fills are less than 6 feet deep.

The load supporting capacity and the stability of the soil as well as the quantity and workability of fill material available are important in design and construction of roads and streets. The AASHTO and Unified classifications of the soil and the soil texture, density, shrink-swell potential, and potential frost action are indicators of the traffic supporting capacity used in making the ratings. Soil wetness, flooding, slope, depth to hard rock or very compact layers, and content of large stones, all of which affect stability and ease of excavation, were also considered.

Sanitary facilities

Favorable soil properties and site features are needed between depths of 18 and 72 inches are evaluated for this use. The soil properties and site features considered are those that affect the absorption of the effluent and those that affect the construction of the system.

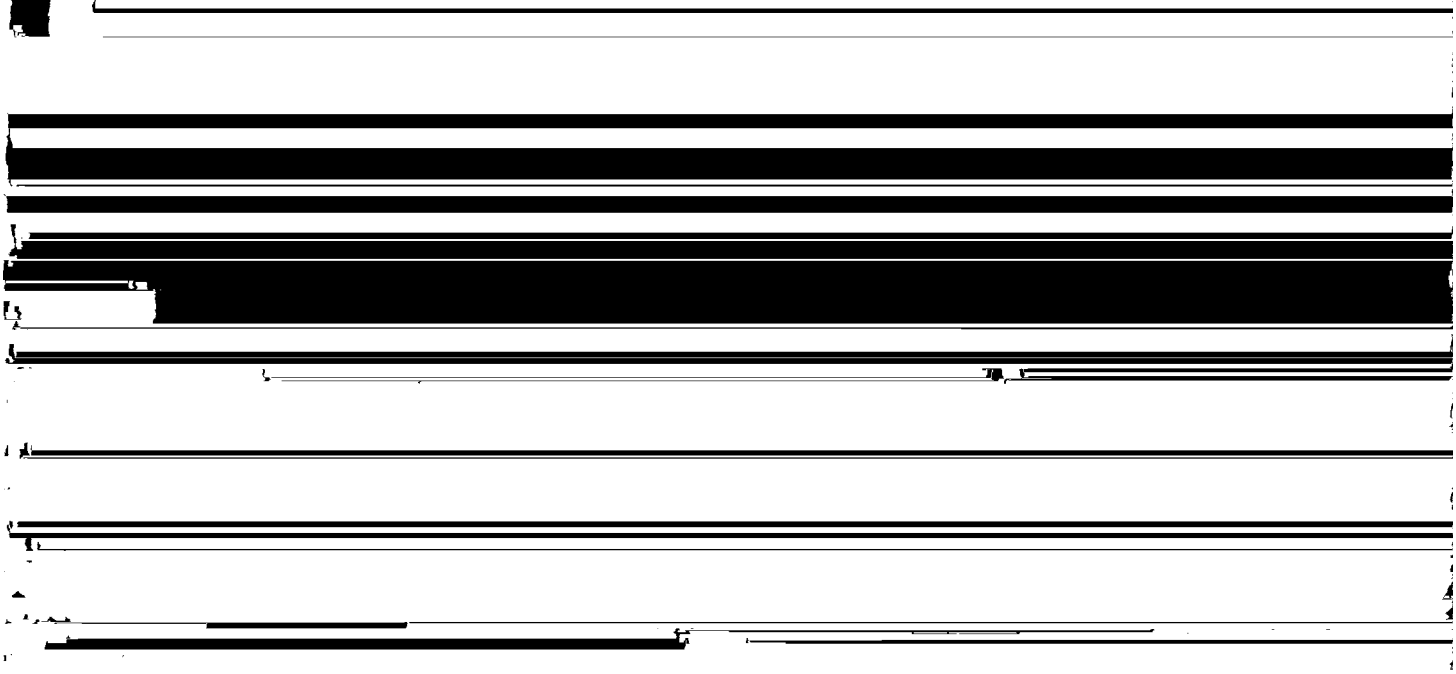
Properties and features that effect the absorption of the effluent are permeability, depth to seasonal high water table, depth to bedrock, and susceptibility to flooding. Stones, boulders, and a shallow depth to bedrock interfere with installation. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas. Also, soil erosion and soil slippage are hazards where absorption fields are installed in sloping soils.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth less than 4 feet below the tile lines. In these soils the absorption field does not adequately filter the effluent, and as a result ground water supplies in the area may be contaminated. Soils having a hazard of inadequate filtration are indicated by footnotes in table 10.

Percolation tests are performed to determine the absorptive capacity of the soil and its suitability for septic tank absorption fields. These tests should be performed during the season when the water table is highest and the soil is at minimum absorptive capacity.

In many of the soils that have moderate or severe limitations for septic tank absorption fields, it may be possible to install special systems that lower the seasonal water table or to increase the size of the absorption field so that satisfactory performance is achieved.

Sewage lagoons are shallow ponds constructed to hold sewage while bacteria decompose the solid and liquid wastes. Lagoons have a nearly level flow area surrounded by cut slopes or embankments of compacted, nearly impervious soil material. They generally are designed so that depth of the sewage is 2 to 5 feet. Impervious soil at least 4 feet thick for the lagoon floor and sides is



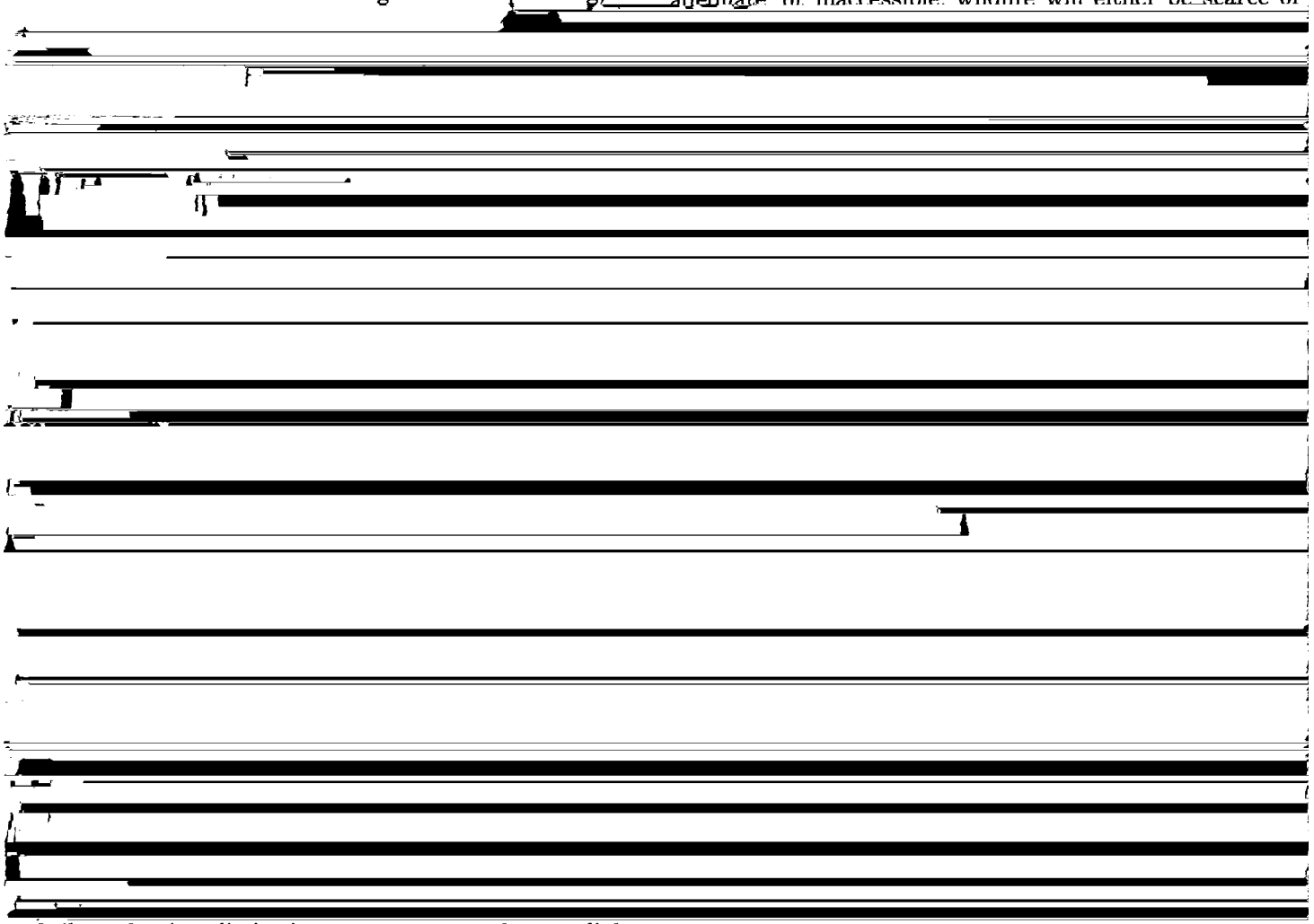
large stones and boulders, and are not subject to flooding.

The ratings apply to the soil profile between the A horizon and a depth of 5 to 6 feet. It is assumed that soil

moisture and nutrients for plant growth are greatly increased by organic matter. Consequently, careful preservation and use of material from these horizons is desirable.

Water management

Many soil properties and site features that affect water management practices have been identified in this soil survey. In table 12 the degree of soil limitation and soil and site features that affect use are indicated for each kind of soil. This information is significant in planning, in-



Soil and site limitation are expressed as slight, moderate, and severe. *Slight* means that the soil properties and site features are generally favorable for the specified use and that any limitation is minor and easily overcome. *Moderate* means that some soil properties or site features are unfavorable for the rated use but can be overcome or modified by special planning and design. *Severe* means that the soil properties and site features are so unfavorable and so difficult to correct or overcome that major soil reclamation, special design, or intensive maintenance is required.

Pond reservoir areas hold water behind a dam or embankment. Soils suitable for this use have low seepage

use of soils for waterways are slope, permeability, erodibility, and suitability for permanent vegetation.

Wildlife Habitat

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover, and they affect the development of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, and water. If any one of these elements is missing, inadequate, or inaccessible, wildlife will either be scarce or

If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, by properly managing the existing plant cover, and by fostering the natural establishment of desirable plants.

In table 13 the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in—

1. Planning the use of parks, wildlife refuges, nature study areas, and other developments for wildlife.
2. Selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are planted for wildlife food and cover. Examples are fescue, lovegrass, switchgrass, bromegrass, clover, alfalfa, and crownvetch. Major soil properties that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations.

Wild herbaceous plants are native or naturally

waterfowl feeding areas, wildlife watering developments, beaver ponds, and farm floodwater detention structures. Major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. The availability of a dependable water supply is important if water areas are to be developed.

The kinds of wildlife habitat are briefly described in the following paragraphs.

Openland habitat consists of croplands, pastures, meadows, and areas that are overgrown with grasses,

[redacted]

The information in table 14 can be supplemented by additional information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 10, and interpretations for

plants, determines soil pH or reaction, and identifies any free carbonates.

Samples of soil material are analyzed in the laboratory to verify the field estimates of soil properties and to

identified as Pt. Soils on the borderline between two classes have a dual classification symbol, for example CL-ML.

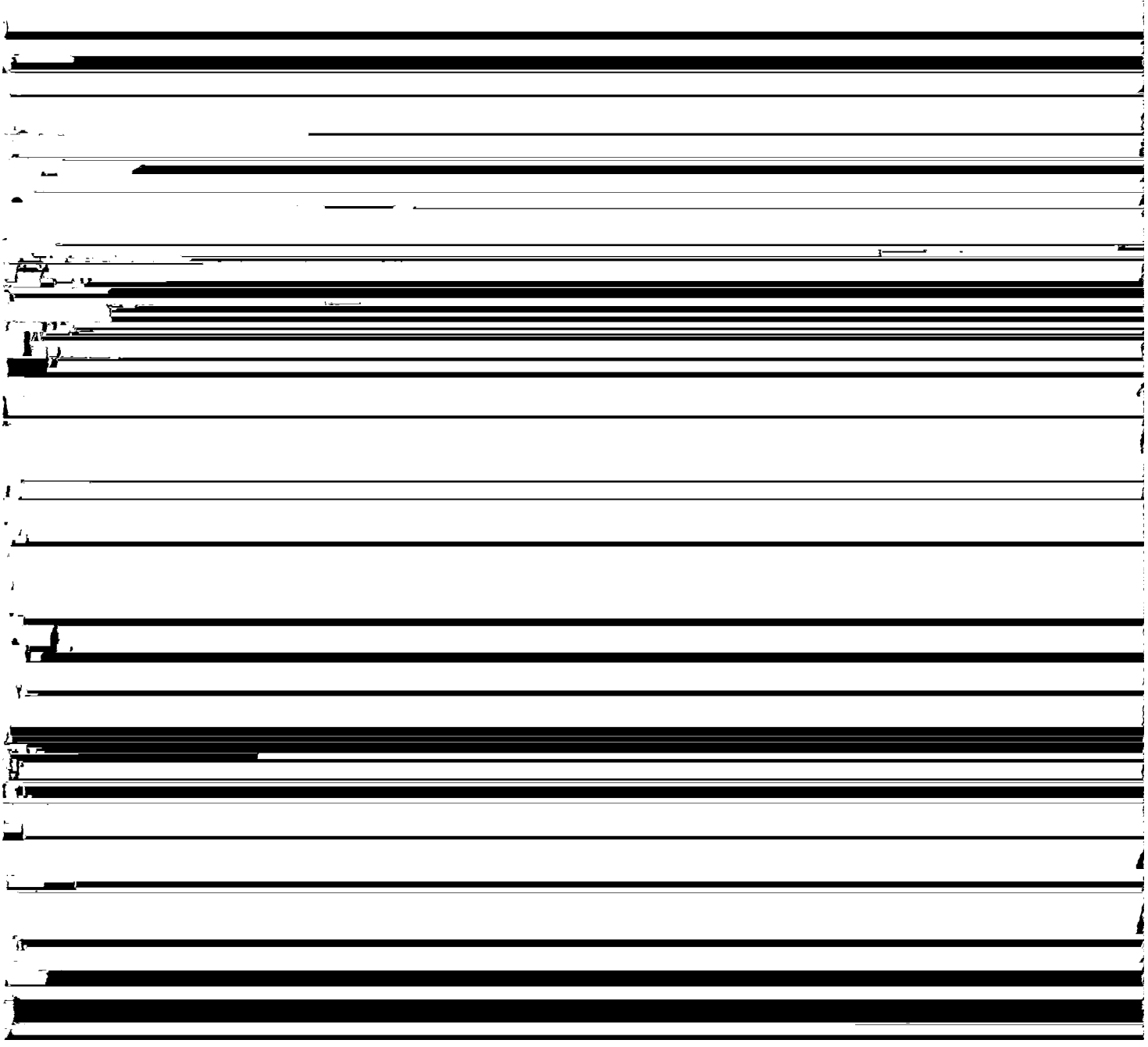
The AASHTO system classifies soils according to those properties that affect their use in highway construction and maintenance. In this system a mineral soil is classified in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines. At the other extreme, in group A-7, are fine-grained soils. Highly organic soils are classified as A-8 on the basis of visual inspection.

When laboratory data are available, the A-1, A-2, and A-7 groups are further classified as follows: A-1-a, A-1-b

in evaluating the potential of soils for septic tank systems and other waste disposal systems, and in many other aspects of land use and management.

Available water capacity is rated on the basis of soil characteristics that influence the ability of the soil to hold water and make it available to plants. Important characteristics are content of organic matter, soil texture, and soil structure. Shallow-rooted plants are not likely to use the available water from the deeper soil horizons. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems.

Soil reaction is expressed as range in pH values. The range in pH of each major horizon is based on many field



those that determine the stability of aggregates that resist breakdown by tillage and abrasion by wind. Among properties of soils that affect their placement in wind erodibility groups are texture, organic matter content, content of calcium carbonate, soil moisture, mineral composition, susceptibility to frost action, and size and stability of aggregates.

Soil and Water Features

Features that relate to runoff or infiltration of water, to flooding, to grading and excavation of each soil are indicated in table 17. This information is helpful in planning land uses and engineering projects that are likely to be affected by the amount of runoff from watersheds, by flooding and a seasonal high water table, by the presence

Information about the seasonal high water table helps in assessing the need for specially designed foundations, the need for specific kinds of drainage systems, and the need for footing drains to insure dry basements. Such information is also needed to decide whether or not to construct basements and to determine how septic tank absorption fields and other underground installations will function. Also, a seasonal high water table affects ease of excavation.

Depth to bedrock is shown for all soils that are underlain by bedrock at depths of 5 to 6 feet or less. For many soils, limited ranges in depth to bedrock is a part of the definition of the soil series. The depths shown are based on measurements made in many soil borings and other observations during the soil mapping. The kind of bedrock and its relative hardness as related to ease of excavation

The system of classification has six categories. Beginning with the broadest, these categories are order, suborder, great group, subgroup, family, and series. In this system the bases for classification are the different soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected for the higher categories are the result of soil genesis or of factors that affect soil genesis. In table 19 the soils of the survey area are classified according to the system. Classes of the system are briefly discussed in the following paragraphs.

SERIES. The series consists of a group of soils that are formed from a particular kind of parent material and have horizons that, except for texture of the surface soil, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineral and chemical composition.

Formation of the Soils

In this section the factors of soil formation and the processes of soil formation are discussed. Table 19 in the section "Classification of the Soils" gives the classification

Native vegetation, such as trees or grasses or a combination of both, has a bearing on the amount of organic matter, amounts and kinds of plant nutrients, and the type of soil structure and consistence. The Vanoss soils formed under native grasses. The fibrous roots of these native grasses promote good granular structure that is high in organic-matter content. This type of vegetation reduces loss of soil nutrients by the recycling and by the feeding ability of the deep grass roots. Consequently, the soils that formed under grass in Pottawatomie County tend to have more bases and organic matter than the soils that formed under trees. The Stephenville soils formed under trees and are therefore lower in plant nutrients and organic matter than those that formed under grasses.

During the past century man has altered this soil-forming process by removing the native vegetation over much of the county. Lack of adequate conservation measures has resulted in much soil loss through sheet and gully erosion.

Relief

Relief affects soil formation through its influence on moisture, drainage, erosion, temperature, and plant cover. The relief of Pottawatomie County is determined largely by the resistance of underlying parent material to weathering and geological erosion. In about 20 percent of Pottawatomie County, the soils are on nearly level or very gently sloping flood plains, and in about 80 percent, they are on uplands.

The effects of relief on soil formation is illustrated by Weatherford and Darnell soils, both of which formed in material weathered from sandstone. The Weatherford soils generally are in areas of less sloping relief. Surface runoff is less, and more water percolates through these soils to influence the loss, gain, or transfer of soil constituents. The Darnell soils are in areas of more sloping relief and have a less clearly defined profile than Weatherford soils. On the more sloping soils, more of the rainwater runs off instead of moving through the soil to help in the formation of a deeper solum.

Time

Time as a factor in soil formation cannot be measured strictly in years. The length of time needed for the development of genetic horizons depends on the intensity and the interactions of soil-forming factors in promoting the losses, gains, transfers, or transformations of soil constituents that are necessary for forming soil horizons. Soils with no definite genetic horizons are young or immature. They have had sufficient time to develop well-expressed horizons, but because they are sloping, geologic erosion has taken away soil material almost as fast as it is formed. The Pulaski and Yahola soils are on flood plains and have been forming for such a short time that they show little horizon development.

Processes of Soil Formation

Processes that have influenced the formation of horizons in the soils of Pottawatomie County are accumulation of organic matter, leaching of calcium carbonates and bases, and translocation of silicate clay minerals. In most soils, more than one of these processes has been active in the development of horizons. Some processes have slowed horizon differentiation.

By adding organic matter to the surface layer, native grasses have contributed to the granular structure of that layer in soils on the prairie. These granular surface layers that are high in organic-matter content, such as the surface layer of Vanoss soils, are called mollic epipedons in the classification system. Stephenville soils formed in material weathered from sandstone under native trees. They contain less organic matter than Vanoss soils, and their surface layer is called an ochric epipedon.

Leaching of calcium carbonates and bases is active in the formation of soils. The accumulation of calcium carbonates and bases in the lower part of the B horizon of the Aydelotte soils indicates the depth to which water has percolated. The Vanoss, Teller, and Zaneis soils have been leached to the extent that they have no accumulation of calcium carbonates. Konawa, Dougherty, and Eufaula soils have a distinct A2 horizon that has been leached of bases. The B horizon of these soils has had much leaching of bases, and this is reflected by their base saturation.

Soils on flood plains, for example Gaddy and Yahola soils, are recharged with bases during each flood. The Pulaski soils have not been leached, but their sediment comes from the leached, acid soils. The Vernon soils, which formed in Permian red beds, are high in carbonates. Calcium carbonates in Vernon soils are related to the nature of the parent material rather than to leaching.

The translocation of silicate clay minerals is very important in the properties and classification of soils. Argillic horizons are diagnostic for classification. Clay films on ped surfaces and bridging sand grains and increases in total clay are used in the field as evidence of argillic horizons. The argillic horizon is present in Kirkland, Renfrow, and Stephenville soils. The varying degrees of translocation of silicate clay minerals and the kind of

tion of an A2 horizon. Geological erosion on gently sloping to strongly sloping Vernon and Darnell soils hinders horizonation through soil losses. The sediment of the Yahola, Pulaski, and other soils on flood plains was deposited so recently that there has not been enough time for the formation of horizons.

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Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Complex, soil. A mapping unit of two or more kinds of soil occurring in such an intricate pattern that they cannot be shown separately on a soil map at the selected scale of mapping and publication.

Compressible. Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under

long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

Excess fines. Excess silt and clay. The soil does not provide a source of gravel or sand for construction purposes.

Fast intake. The rapid movement of water into the soil.

Favorable. Favorable soil features for the specified use.

Fine textured (heavy textured) soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Forb. Any herbaceous plant not a grass or a sedge.

Granule. A single mass, or cluster, of many individual soil particles.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Habitat. The natural abode of a plant or animal; refers to the kind of environment in which a plant or animal normally lives, as opposed to the range or geographical distribution.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon.—An organic layer, fresh and decaying plant residue, at the surface of a mineral soil.

A horizon.—The mineral horizon, formed or forming at or near the surface, in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon most of which was originally part of a B horizon.

A2 horizon.—A mineral horizon, mainly a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or a combination of these; (2) by prismatic or blocky structure; (3) by redder or browner colors than those in the A horizon; or (4) by a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that from which the solum is presumed to have formed. If the material is known to differ from that in the solum the Roman numeral II precedes the letter C.

Mature soil. Any soil with well developed horizons having characteristics produced by the natural processes of soil formation and in near equilibrium with its present envrironment.

Miscellaneous areas. Areas that have little or no natural soil, are too nearly inaccessible for orderly examination, or cannot otherwise be feasibly classified.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three single variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in the production of food and tissue. Plant nutrients are nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil; and carbon, hydrogen, and oxygen obtained largely from the air and water.

Organic matter. A general term for plant and animal material, in or on the soil, in all stages of decomposition. Readily decomposed organic matter is often distinguished from the more stable forms that are past the stage of rapid decomposition.

Overgrazing. Grazing so heavy as to impair future forage production and to deteriorate plants or soil, or both. Contrasts with undergrazing.

Parent material. The great variety of unconsolidated organic and mineral material in which soil forms. Consolidated bedrock is not yet parent material by this concept.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Percs slowly. The slow movement of water through the soil adversely affecting the specified use.

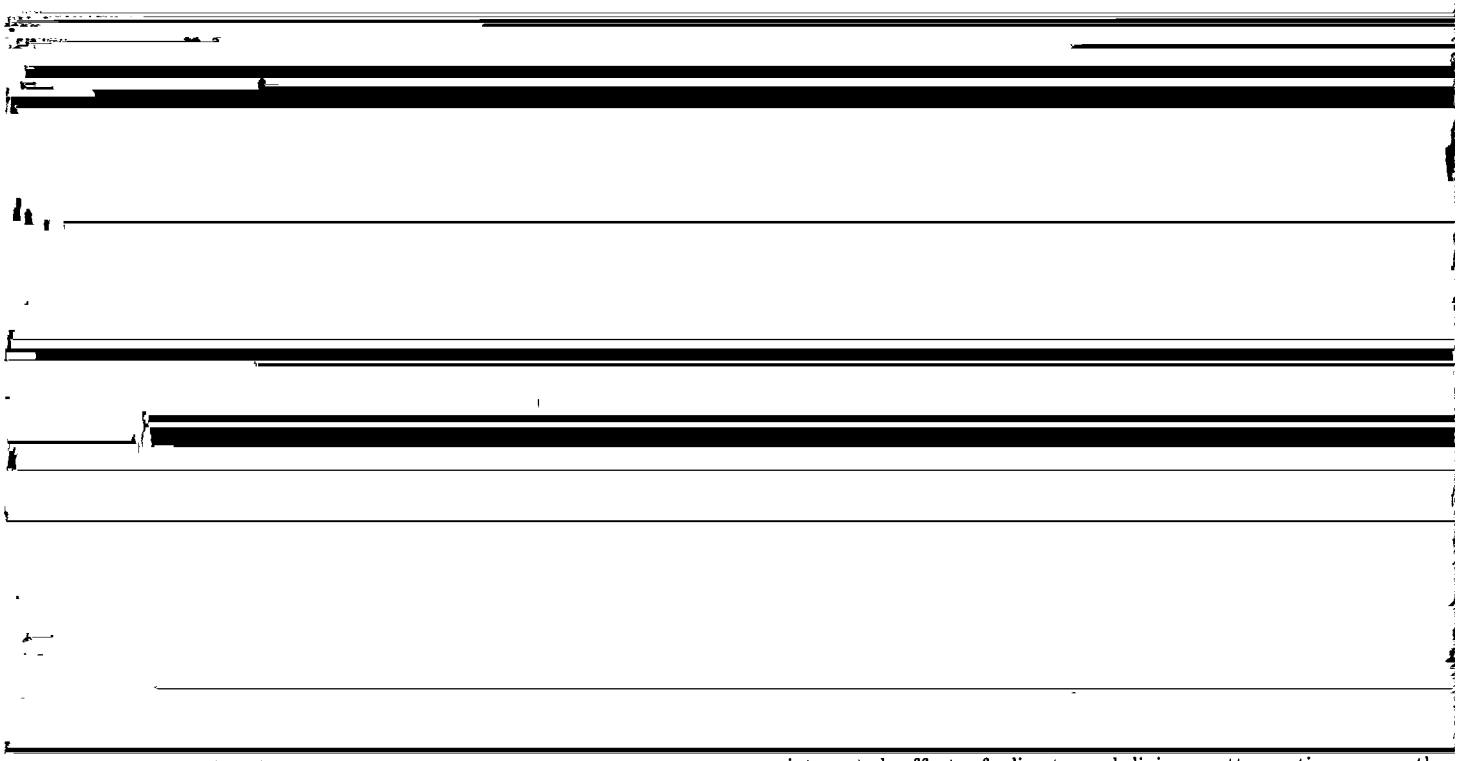
Permeability. The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are *very slow* (less than 0.06 inch), *slow* (0.06 to 0.20 inch), *moderately slow* (0.2 to 0.6 inch), *moderate* (0.6 to 2.0 inches), *moderately rapid* (2.0 to 6.0 inches), *rapid* (6.0 to 20 inches), and *very rapid* (more than 20 inches).

Phase, soil. A subdivision of a soil series or other unit in the soil classification system based on differences in the soil that affect its management. A soil series, for example, may be divided into phases on the bases of differences in slope, stoniness, thickness or some other characteristic that affects management. These differences are too small to justify separate series.

pH value. (See Reaction, soil). A numerical designation of acidity and alkalinity in soil.

Piping. Moving water of subsurface tunnels or pipelike cavities in the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil



Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist

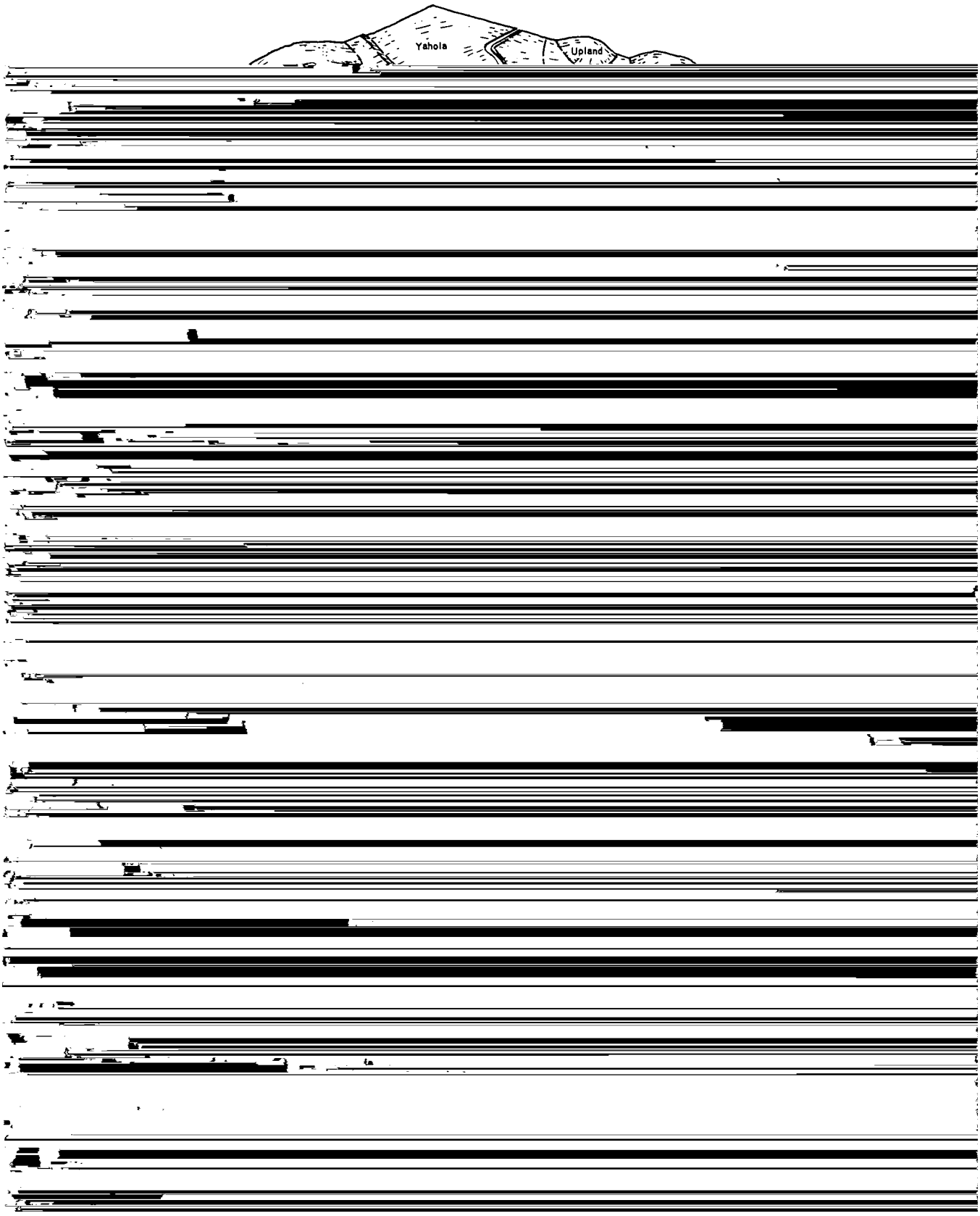
integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

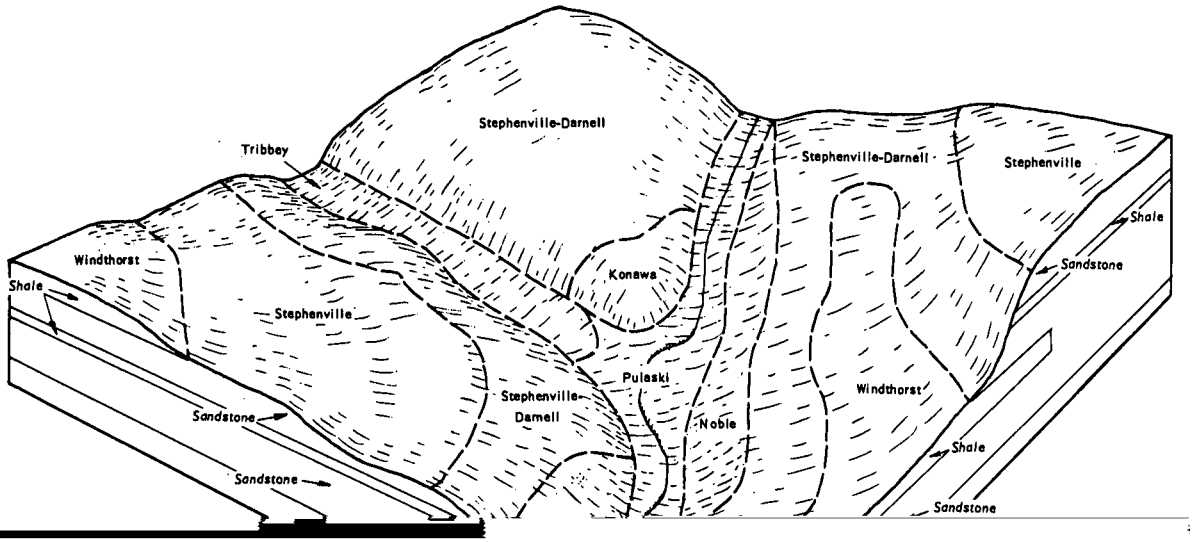
Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristics of the soil are largely confined to the solum.

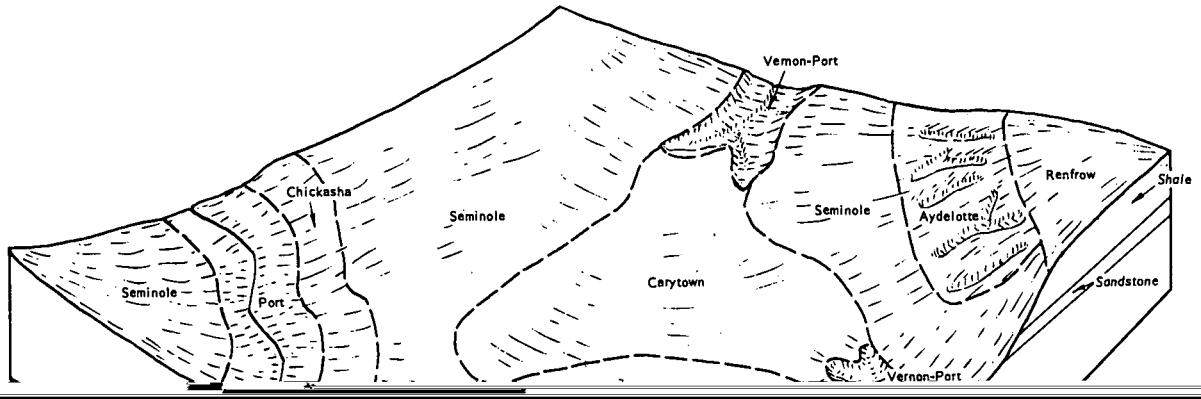
Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

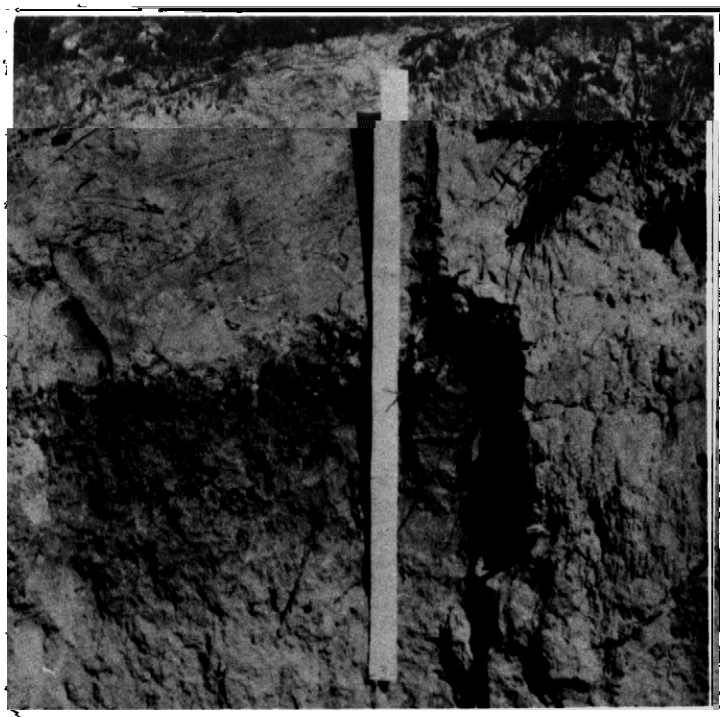
Structure, soil. The arrangement of primary soil particles into com-

I L L U S T R A T I O N S


Yahola
Upland


Stephenville-Darnell
Tribbey
Stephenville-Darnell
Stephenville
Shale
Sandstone
Windthorst
Shale
Konawa
Stephenville
Stephenville-
Darnell
Pulaski
Noble
Windthorst
Shale
Sandstone
Sandstone
Sandstone


Vernon-Port
Chickasha
Seminole
Seminole
Port
Seminole
Carytown
Aydelotte
Renfrow
Shale
Sandstone
Vernon-Port



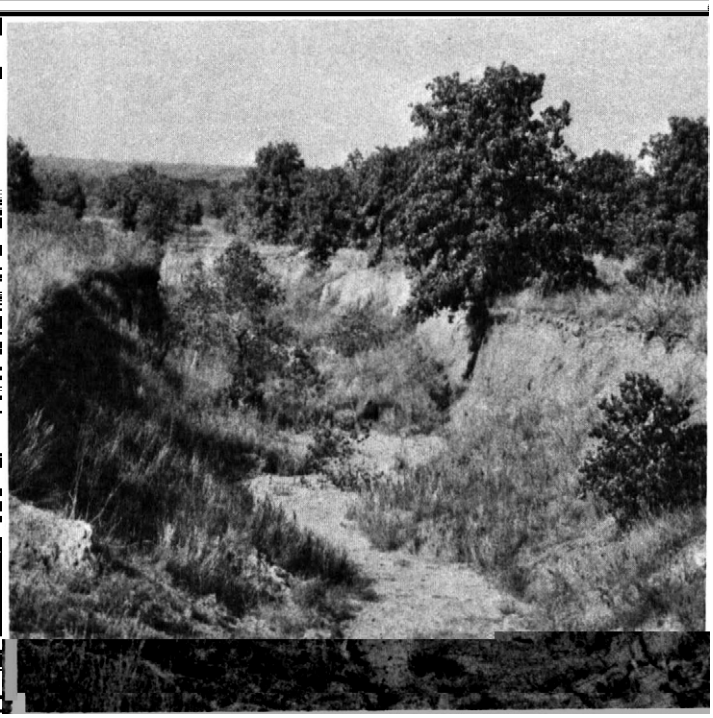


Figure 8.—Profile of Darnell fine sandy loam.

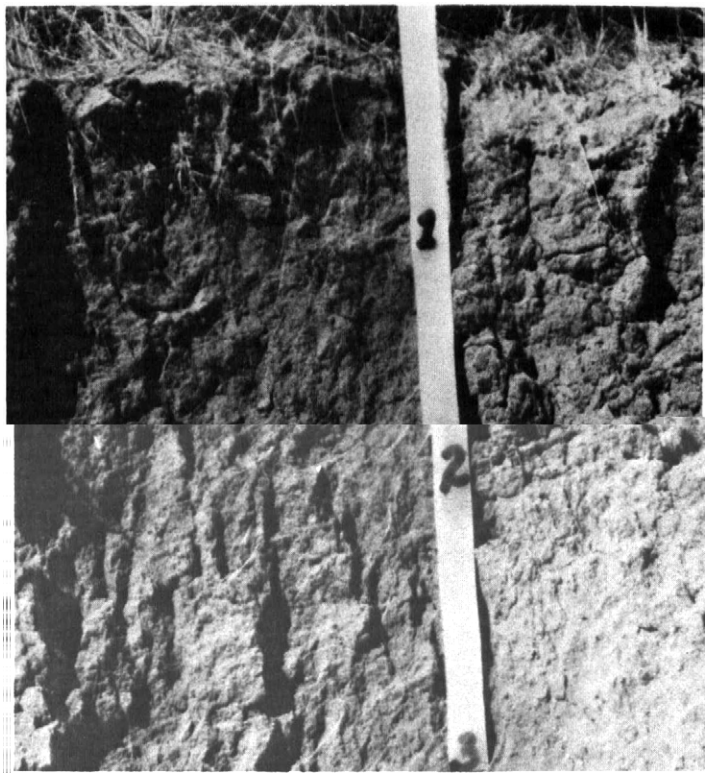


Figure 9.—Profile of Teller fine sandy loam, 3 to 5 percent slopes.

Figure 10.—Peanuts on Zaneis loam, 1 to 3 percent slopes.

A P P E N D I X

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION DATA

[Data for Shawnee, Pottawatomie County. Temperature 1942-71; precipitation, 1941-70]

Month	Temperature				Precipitation				
	Average daily maximum	Average daily minimum	Average maximum	Average minimum	Average	One year in 10 will have-		Days with snow cover of 1 inch or more	Average depth of snow on days with snow cover
						Less than--	More than--		
	F	F	F	F	In	In	In	In	In
January----	51	27	73	5	1.4	0.2	3.0	2	2
February---	56	30	76	13	1.8	0.5	3.5	2	2
March------	63	37	84	18	2.4	0.7	4.5	0	3
April------	74	50	89	32	4.5	1.5	8.3	0	0
May--------	80	58	91	42	6.2	2.5	10.5	0	0
June-------	89	66	97	53	4.6	1.1	9.2	0	0
July-------	94	70	102	60	3.3	0.8	6.7	0	0
August-----	94	68	103	57	2.9	0.7	5.8	0	0
September--	87	60	99	44	3.9	0.5	8.7	0	0
October----	77	50	90	32	3.1	0.3	7.5	0	0
November---	64	38	79	20	2.0	0.1	4.5	0	0
December---	53	30	73	11	1.6	0.3	3.3	1	2
Year------	74	49	105	2	37.7	25.4	51.0	2	2

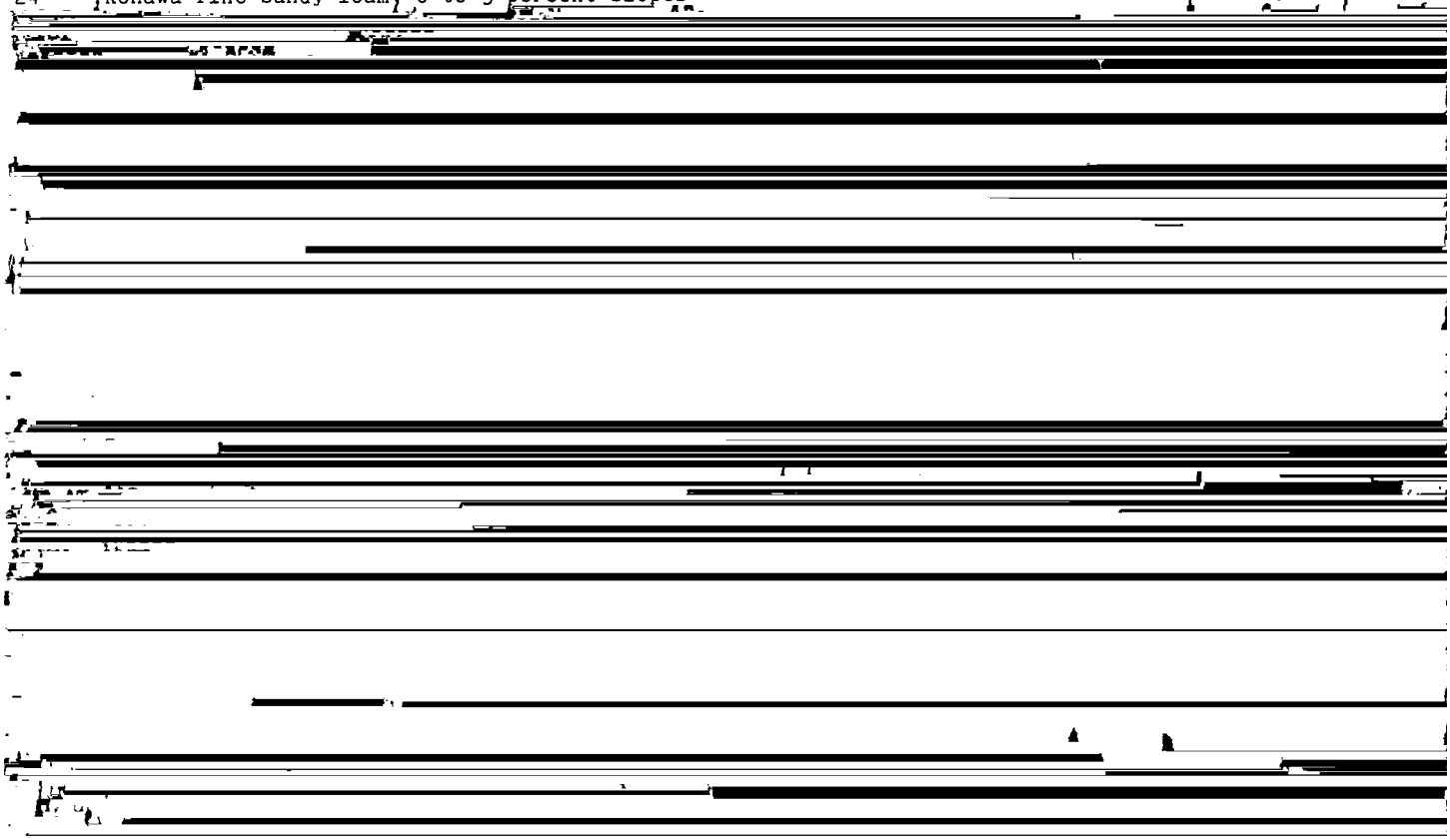
TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Data are from Shawnee, Pottawatomie County, 1921-68]

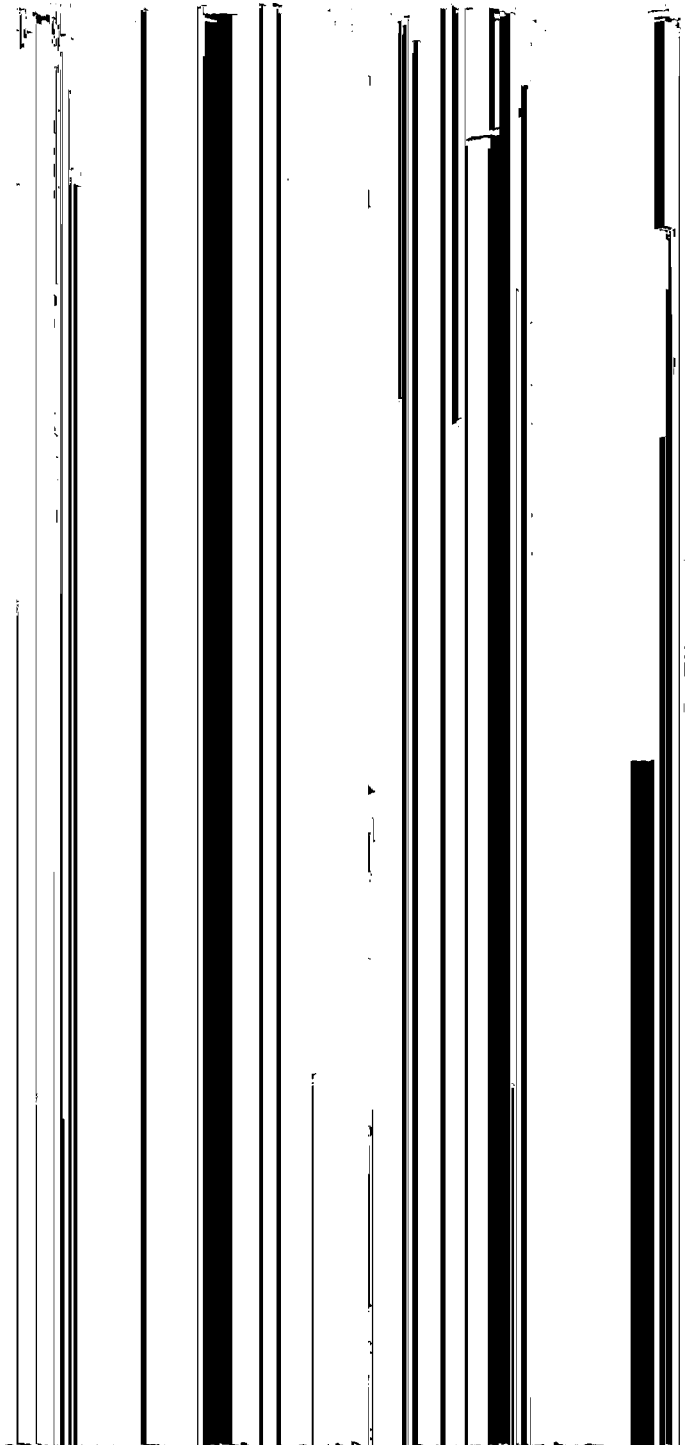
Probability	Minimum temperature				
	16° F	20° F	24° F	28° F	32° F
Spring:					
1 year in 10 later than---	Mar. 11	Mar. 25	Apr. 1	Apr. 11	Apr. 17
2 years in 10 later than---	Mar. 2	Mar. 18	Mar. 26	Apr. 6	Apr. 12
5 years in 10 later than---	Feb. 13	Mar. 5	Mar. 15	Mar. 26	Apr. 3
Fall:					
1 year in 10 earlier than-	Nov. 23	Nov. 13	Nov. 3	Oct. 24	Oct. 17
2 years in 10 earlier than-	Nov. 30	Nov. 19	Nov. 9	Oct. 29	Oct. 21
5 years in 10 earlier than-	Dec. 16	Dec. 2	Nov. 22	Nov. 10	Oct. 31

TABLE 3.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1	Asher silty clay loam	4,490	0.9
2	Aydelotte loam, 2 to 5 percent slopes	11,640	2.3
3	Aydelotte clay loam, 3 to 6 percent slopes, severely eroded	18,850	3.7
4	Borrow Pits	270	0.1
5	Carytown silt loam, 0 to 1 percent slopes	1,290	0.3
6	Chickasha loam, 1 to 3 percent slopes	2,850	0.6
7	Chickasha loam, 3 to 5 percent slopes	9,195	1.8
8	Chickasha and Zaneis soils, 1 to 8 percent slopes, severely eroded	17,270	3.4
9	Chigley complex, 3 to 12 percent slopes	5,195	1.0
10	Dougherty loamy fine sand, 0 to 3 percent slopes	825	0.2
11	Dougherty loamy fine sand, 3 to 8 percent slopes	2,450	0.5
12	Eufaula fine sand, 0 to 3 percent slopes	2,600	0.5
13	Eufaula fine sand, 3 to 12 percent slopes	8,845	1.7
14	Fluvents, 8 to 15 percent slopes	1,335	0.3
15	Gaddy loamy fine sand	6,720	1.3
16	Galey fine sandy loam, 0 to 2 percent slopes	1,810	0.4
17	Gracemont fine sandy loam	4,280	0.8
18	Gracemore fine sand	2,065	0.4
19	Gravel pits	755	0.1
20	Harjo clay	3,270	0.6
21	Keokuk silt loam	10,450	2.0
22	Kirkland silt loam, 0 to 1 percent slopes	1,135	0.2
23	Konawa loamy fine sand, 3 to 8 percent slopes	7,315	1.4
24	Konawa fine sandy loam, 0 to 3 percent slopes	4,060	0.8



Total A.U.M.	Hay Ton
7.0	2.8
6.5	2.6
5.5	2.2
4.0	1.6
4.0	1.6
7.5	3.0
7.5	3.0
7.5	2.0
8.0	3.2
8.0	3.2
6.0	2.4
6.5	2.6
7.0	2.8
7.0	2.6
3.5	1.4
2.5	1.0
6.0	2.4
6.0	2.4
5.0	2.0



INCIPAL PASTURE AND HAY PLANTS--Continued

	Animal unit months[1] per acre												Total	
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	A.U.M.	Hay Ton
	--	--	--	--	1.2	1.2	0.7	0.5	0.8	0.6	--	--	5.0	2.0
ss	--	--	--	--	1.1	1.1	0.8	0.5	0.6	0.4	--	--	4.5	1.8
ss	--	--	--	--	1.2	1.2	0.9	0.6	0.7	0.4	--	--	5.0	2.0
	--	--	--	--	1.0	1.0	0.5	0.4	0.6	0.5	--	--	4.0	1.6
	--	--	--	0.6	1.0	0.8	0.5	0.4	0.5	0.2	--	--	4.0	1.6
ss	--	--	--	--	1.0	1.0	0.7	0.5	0.5	0.3	--	--	4.0	1.6
	--	--	--	0.9	1.5	1.2	0.7	0.6	0.8	0.3	--	--	6.0	2.4
ss	--	--	--	--	1.3	1.3	0.9	0.7	0.8	0.5	--	--	5.5	2.2
ss	--	--	--	--	1.0	1.0	0.7	0.5	0.5	0.3	--	--	4.0	1.6
	--	--	--	0.7	1.1	0.9	0.5	0.5	0.6	0.2	--	--	4.5	1.8
ss	--	--	--	--	0.7	0.7	0.5	0.4	0.4	0.3	--	--	3.0	1.2
	--	--	--	0.5	0.9	0.7	0.4	0.4	0.5	0.1	--	--	3.5	1.4

ed required to feed one animal unit (one cow, one horse, one mule, five

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[All yields were estimated for a high level of management in 1974. Absence of a yield figure indicates the crop is seldom grown or is not suited]

Soil name and map symbol	Wheat	Alfalfa hay	Grain sorghum	Peanuts	Soybeans	Improved bermudagrass
	Bu	Ton	Bu	Lb	Bu	AUM[1]
Asher:						
1	35	4.5	55	---	30	7.5
Aydelotte:						
2	20	---	20	---	---	2.5
3	---	---	---	---	---	2.0
Borrow Pits:						
4	---	---	---	---	---	---
Carytown:						
5	30	2.5	40	---	25	5.0
Chickasha:						
6	30	2.5	40	1,500	30	5.5
7	25	---	35	1,300	25	5.0
8[2]	---	---	---	---	---	4.0
Chigley:						
9[2]	---	---	---	---	---	3.5
Dougherty:						
10	20	---	30	1,100	---	5.0
11	15	---	25	1,100	---	5.0
Eufaula:						
12	15	---	25	1,100	---	4.0
13	---	---	---	---	---	3.5
Fluvents:						
14	---	---	---	---	---	6.0
Gaddy:						
15	20	3.0	30	1,300	20	6.0
Galey:						
16	30	3.0	50	1,500	30	7.0
Gracemont:						
17	---	---	---	---	---	8.0
Gracemore:						
18	---	---	---	---	---	7.0
Gravel Pits:						
19	---	---	---	---	---	---
Harjo:						
20	---	---	---	---	---	4.0
Keokuk:						
21	35	4.5	65	1,800	30	8.0
Kirkland:						
22	30	2.5	40	---	25	5.5
Konawa:						
23	20	---	30	---	---	5.5
24	30	3.0	50	1,600	30	7.0

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Wheat	Alfalfa hay	Grain sorghum	Peanuts	Soybeans	Improved bermudagrass
	Bu	Ton	Bu	Lb	Bu	AUM[1]
Konawa:						
25	25	---	40	1,300	25	6.5
26	---	---	---	---	---	5.0
Latanier:						
27	35	3.5	65	---	30	8.0
Lela:						
28	30	3.5	55	---	30	6.5
Miller:						
29	35	3.5	60	---	30	6.5
Noble:						
30	20	---	35	---	---	5.5
Norge:						
31	30	3.0	50	1,500	30	7.0
32	25	---	45	1,300	25	6.5
Port:						
33	35	4.5	60	1,800	30	8.0
[2]34	---	---	---	---	---	8.0
Pulaski:						
35	30	4.0	50	1,600	30	7.5
Renfrow:						
36	25	---	30	---	25	3.0
37	20	---	25	---	20	2.5
Sayers:						
[2]38	20	2.5	25	1,100	20	5.5
Seminole:						
39	30	---	40	1,500	30	6.0
40	25	---	35	1,300	25	5.5
Stephenville:						
41	25	---	40	1,350	25	6.0
42	20	---	35	1,150	20	5.5
[2]43	---	---	---	---	---	4.5
Teller:						
44	25	---	40	1,300	25	6.5
Tribbey:						
45	---	---	---	---	---	8.0
Vanoss:						
46	35	3.5	55	1,700	30	7.5
47	30	3.0	50	1,500	30	7.0
Vernon:						
48	15	---	20	---	15	2.0
49	---	---	---	---	---	1.5
[2]50	---	---	---	---	---	2.0

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Wheat	Alfalfa hay	Grain sorghum	Peanuts	Soybeans	Improved bermudagrass
	Bu	Ton	Bu	Lb	Bu	AUM[1]
Weatherford:						
51	30	---	45	1,400	30	6.0
52	25	---	40	1.200	25	4.0
[2]53	---	---	---	---	---	4.0
Windthorst:						
54	20	---	40	1,100	20	4.5
Yahola:						
55	30	4.0	50	1,600	30	7.5
Zaneis:						
56	30	2.6	40	1,400	30	6.5
57	25	---	35	1,200	25	6.0

[1]Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one steer; five hogs; or five sheep) for 1 month without damage to the pasture.

[2]This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

TABLE 6.--RANGE PRODUCTIVITY AND COMPOSITION

[Soils not in range sites can be used for grazing if grass cover is established]

Soil name and map symbol	Range site name	Potential production		Common plant name	Composition
		Kind of year	Dry weight		
			Lbs/acre		Pct
Asher:					
1	Loamy Bottomland	Favorable	8,000	Big bluestem	25
		Normal	5,600	Indiangrass	15
		Unfavorable	4,000	Switchgrass	15
				Little bluestem	10
				Eastern gamagrass	5
				Tall dropseed	5
				Florida paspalum	5
				Canada wildrye	5
				Maximillan sunflower	5
				Eastern cottonwood	5
				Other trees	5
Aydelotte:					
2	Claypan Prairie	Favorable	4,000	Little bluestem	25
		Normal	2,800	Big bluestem	20
		Unfavorable	2,000	Switchgrass	15
				Indiangrass	10
				Side-oats grama	5
				Blue grama	5
				Buffalograss	5
				Leadplant	5
				Goldenrod	5
				Coralberry	5
3	Eroded Clay	Favorable	2,000	Side-oats grama	30
		Normal	1,400	Blue grama	15
		Unfavorable	1,000	Buffalograss	15
				Little bluestem	10
				Prairieclover	3
				Dalea species	2
				Maximilian sunflower	2
				Other perennial grasses	15
				Other perennial forbs	8

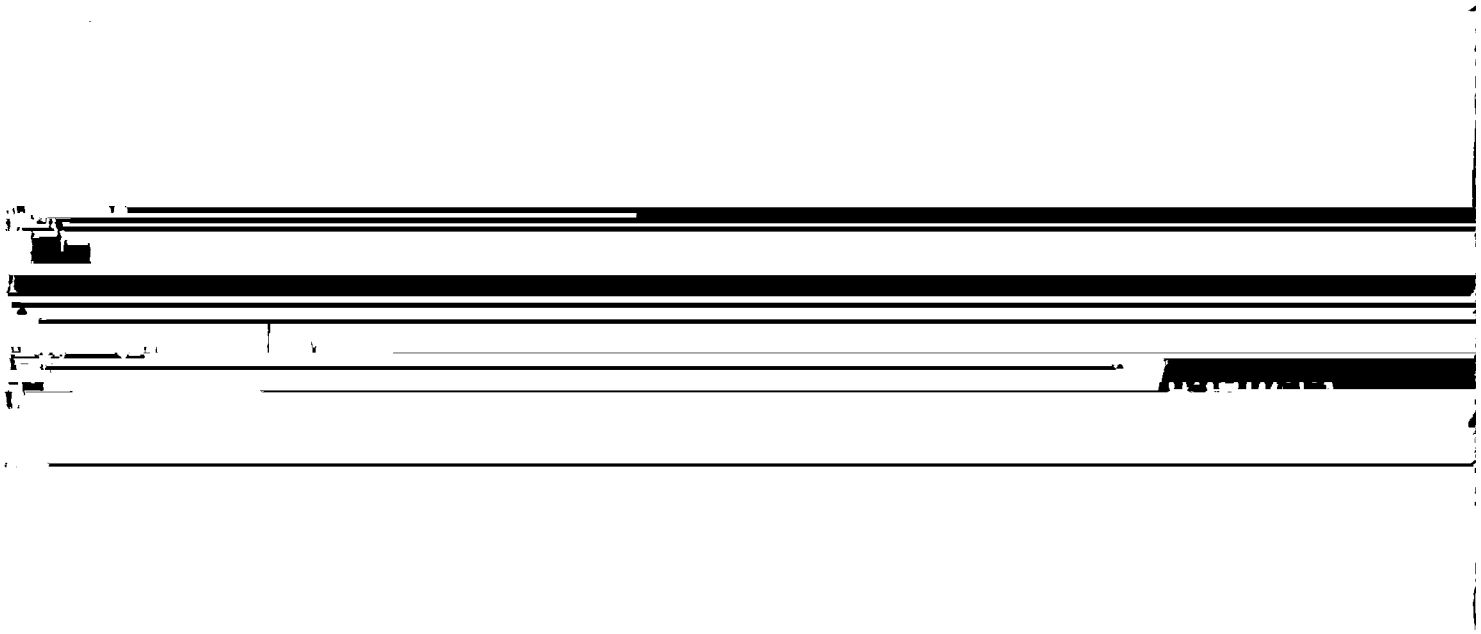


TABLE 6.--RANGE PRODUCTIVITY AND COMPOSITION--Continued

Soil name and map symbol	Range site name	Potential production		Common plant name	Composition
		Kind of year	Dry weight		
			Lbs/acre		Pct
Chickasha: [1]8:					
Chickasha part---	Eroded Prairie----------	Favorable	3,500	Little bluestem----------	35
		Normal	2,600	Big bluestem----------	10
		Unfavorable	1,800	Side-oats grama----------	10
				Tall dropseed----------	10
				Indiangrass----------	5
				Switchgrass----------	5
				Blue grama----------	5
				Other perennial grasses-------	20
Zaneis part------	Eroded Prairie----------	Favorable	3,500	Little bluestem----------	35
		Normal	2,600	Big bluestem----------	15
		Unfavorable	2,500	Side-oats grams----------	10
				Tall dropseed----------	5
				Indiangrass----------	5
				Switchgrass----------	5
				Blue grama----------	5
				Other perennial grasses-------	20
Chigley: [1]9----------	Sandy Savannah----------	Favorable	5,000	Little bluestem----------	25
		Normal	3,500	Big bluestem----------	20
		Unfavorable	2,500	Indiangrass----------	5
				Switchgrass----------	5
				Sand lovegrass----------	5
				Scribner panicum----------	5
				Purpletop----------	5
				Tall dropseed----------	5
				Perennial sunflower----------	5
				Goldenrod----------	5
				Trees----------	15

See footnotes at end of table.

TABLE 6.--RANGE PRODUCTIVITY AND COMPOSITION--Continued

Soil name and map symbol	Range site name	Potential production		Common plant name	Composition
		Kind of year	Dry weight		
			Lbs/ acre		Pct
Dougherty:					
10, 11	Deep Sand Savannah	Favorable	4,000	Little bluestem	25
		Normal	2,800	Big bluestem	10
		Unfavorable	2,000	Sand bluestem	10
				Indiangrass	5
				Switchgrass	5
				Purpletop	5
				Arrowfeather threeawn	5
				Scribner panicum	5
				Side-oats grama	5
				Perennial lespedezas	5
				Trees	20
Eufaula:					
12, 13	Deep Sand Savannah	Favorable	4,000	Little bluestem	25
		Normal	2,800	Big bluestem	10
		Unfavorable	2,000	Sand bluestem	10
				Indiangrass	5
				Switchgrass	5
				Purpletop	5
				Arrowfeather threeawn	5
				Scribner panicum	5
				Side-oats grama	5
				Perennial lespedezas	5
				Trees	20
Fluvents:					
14	Loamy Bottomland	Favorable	6,000	Big bluestem	25
		Normal	4,200	Indiangrass	15
		Unfavorable	3,000	Switchgrass	15
				Little bluestem	10
				Eastern gamagrass	5
				Tall dropseed	5
				Beaked panicum	5
				Compassplant	5
				Sedges	5
				Heath aster	5
				Trees	5
Gaddy:					
15	Sandy Bottomland	Favorable	3,800	Switchgrass	30
		Normal	2,700	Sand bluestem	15
		Unfavorable	2,000	Indiangrass	15
				Little bluestem	5
				Texas bluegrass	5
				Beaked panicum	5
				Purpletop	5
				Goldenrod	5
				Heath aster	5
				Maximilian sunflower	5
				Trees	5
Galey:					
16	Sandy Savannah	Favorable	4,500	Big bluestem	20
		Normal	3,800	Little bluestem	25
		Unfavorable	2,500	Indiangrass	5
				Switchgrass	5
				Purpletop	5
				Scribner panicum	5
				Purple lovegrass	5
				Jointtail grass	5
				Splitbeard bluestem	5
				Silver bluestem	5
				Trees	15

See footnotes at end of table.

TABLE 6.--RANGE PRODUCTIVITY AND COMPOSITION--Continued

Soil name and map symbol	Range site name	Potential production		Common plant name	Composition
		Kind of year	Dry weight		
			Lbs/ acre		Pct
Gracemont: 17	Subirrigated	Favorable	9,000	Switchgrass	25
		Normal	7,800	Big bluestem	20
		Unfavorable	7,000	Indiangrass	10
				Eastern gamagrass	10
				Canada wildrye	5
				Maximilian sunflower	5
				Other perennial grasses	20
				Trees	5
Gracemore: 18	Subirrigated	Favorable	9,000	Switchgrass	25
		Normal	7,500	Big bluestem	20
		Unfavorable	7,000	Indiangrass	10
				Eastern gamagrass	10
				Beaked panicum	10
				Canada wildrye	5
				Scribner panicum	5
				Purpletop	5
				Maximilian sunflower	5
				Trees	5
Gravel Pits: 19	No range site.				
Harjo: 20	Wetland	Favorable	4,500	Bushy bluestem	20
		Normal	3,600	Willow	15
		Unfavorable	3,000	Eastern cottonwood	15
				Switchgrass	10
				Indiangrass	5
				Big bluestem	5
				Little bluestem	5
				Beaked panicum	5
				Sedges	5
				Cattail	5
				Other trees	10
Keokuk: 21	Loamy Bottomland	Favorable	4,000	Little bluestem	25
		Normal	6,100	Indiangrass	15
		Unfavorable	4,500	Switchgrass	15
				Little bluestem	10
				Eastern gamagrass	5
				Tall dropseed	5
				Florida paspalum	5
				Canada wildrye	5
				Maximilian sunflower	5
				Eastern cottonwood	5
				Other trees	5
Kirkland: 22	Claypan Prairie	Favorable	4,000	Little bluestem	25
		Normal	2,800	Big bluestem	20
		Unfavorable	2,000	Switchgrass	15
				Indiangrass	10
				Side-oats grama	5
				Blue grama	5
				Buffalograss	5
				Goldenrod	5
				Coralberry	5
				Leadplant	3
				Bundleflower	2

See footnotes at end of table.

TABLE 6.--RANGE PRODUCTIVITY AND COMPOSITION--Continued

Soil name and map symbol	Range site name	Potential production		Common plant name	Composition
		Kind of year	Dry weight		
			Lbs/ acre		Pct
Konawa:					
23	Deep Sand Savannah	Favorable	3,800	Little bluestem	25
		Normal	2,700	Big bluestem	20
		Unfavorable	1,800	Indiangrass	5
				Switchgrass	5
				Purpletop	5
				Scribner panicum	5
				Arrowfeather threeawn	5
				Side-oats grama	5
				Perennial lespedezas	5
				Trees	20
24, 25	Sandy Savannah	Favorable	4,500	Little bluestem	25
		Normal	3,800	Big bluestem	20
		Unfavorable	2,500	Indiangrass	5
				Switchgrass	5
				Purpletop	5
				Scribner panicum	5
				Other perennial grasses	20
				Trees	15
26	Eroded Sandy Savannah	Favorable	2,500	Little bluestem	30
		Normal	1,600	Indiangrass	10
		Unfavorable	1,250	Big bluestem	5
				Switchgrass	5
				Purpletop	5
				Scribner panicum	5
				Other perennial grasses	25
				Trees	15
Latanier:					
27	Heavy Bottomland	Favorable	5,500	Big bluestem	25
		Normal	3,700	Switchgrass	15
		Unfavorable	2,500	Indiangrass	15
				Prairie cordgrass	10
				Western wheatgrass	5
				Tall dropseed	5
				Perennial sunflower	5
				Goldenrod	5
				Sedges	5
				Trees	10
Lela:					
28	Heavy Bottomland	Favorable	5,500	Big bluestem	25
		Normal	3,700	Switchgrass	15
		Unfavorable	2,500	Indiangrass	15
				Prairie cordgrass	10
				Western wheatgrass	5
				Tall dropseed	5
				Perennial sunflower	5
				Goldenrod	5
				Sedges	5
				Trees	10
Miller:					
29	Heavy Bottomland	Favorable	5,000	Big bluestem	25
		Normal	3,200	Switchgrass	15
		Unfavorable	2,000	Indiangrass	15
				Prairie cordgrass	10
				Western wheatgrass	5
				Tall dropseed	5
				Perennial sunflower	5
				Goldenrod	5
				Sedges	5
				Trees	10

See footnotes at end of table.

TABLE 6.--RANGE PRODUCTIVITY AND COMPOSITION--Continued

Soil name and map symbol	Range site name	Potential production		Common plant name	Composition
		Kind of year	Dry weight		
			Lbs/ acre		Pct
Noble:					
30	Sandy Savannah	Favorable	4,500	Little bluestem	25
		Normal	3,300	Big bluestem	20
		Unfavorable	2,500	Indiangrass	5
				Switchgrass	5
				Perennial sunflower	5
				Other perennial grasses	20
				Trees	10
				Other shrubs	5
				Other perennial forbs	5
Norge:					
31, 32	Loamy Prairie	Favorable	5,000	Little bluestem	25
		Normal	3,500	Big bluestem	20
		Unfavorable	2,500	Indiangrass	10
				Switchgrass	10
				Canada wildrye	5
				Side-oats grama	5
				Blue grama	5
				Tall dropseed	5
				Prairieclover	5
				Dotted gayfeather	5
				Trees	5
Port:					
33, [1]34	Loamy Bottomland	Favorable	8,500	Big bluestem	25
		Normal	6,100	Indiangrass	15
		Unfavorable	4,500	Switchgrass	15
				Little bluestem	10
				Eastern gamagrass	5
				Tall dropseed	5
				Beaked panicum	5
				Compassplant	5
				Heath aster	5
				Sedges	5
				Trees	5
Pulaski:					
35	Loamy Bottomland	Favorable	8,500	Big bluestem	25
		Normal	6,100	Indiangrass	15
		Unfavorable	4,500	Switchgrass	15
				Little bluestem	10
				Eastern gamagrass	5
				Tall dropseed	5
				Beaked panicum	5
				Compassplant	5
				Sedges	5
				Heath aster	5
				Trees	5
Renfrow:					
36, 37	Claypan Prairie	Favorable	4,000	Little bluestem	25
		Normal	2,800	Big bluestem	20
		Unfavorable	2,000	Switchgrass	15
				Indiangrass	10
				Side-oats grama	5
				Blue grama	5
				Buffalograss	5
				Leadplant	5
				Goldenrod	5
				Coralberry	5

See footnotes at end of table.

TABLE 6.--RANGE PRODUCTIVITY AND COMPOSITION--Continued

Soil name and map symbol	Range site name	Potential production		Common plant name	Composition
		Kind of year	Dry weight		
			Lbs/ acre		Pct
Sayers:					
[1]38	Sandy Bottomland	Favorable	3,800	Switchgrass	30
		Normal	2,700	Sand bluestem	15
		Unfavorable	2,000	Indiangrass	15
				Little bluestem	5
				Texas bluegrass	5
				Beaked panicum	5
				Purpletop	5
				Goldenrod	5
				Heath aster	5
				Maximilian sunflower	5
				Trees	5
Seminole:					
39, 40	Loamy Prairie	Favorable	5,000	Little bluestem	25
		Normal	3,500	Big bluestem	20
		Unfavorable	2,500	Indiangrass	10
				Switchgrass	10
				Canada wildrye	5
				Side-oats grama	5
				Blue grama	5
				Tall dropseed	5
				Perennial lespedezas	5
				Dotted gayfeather	5
				Shrubs	5
Stephenville:					
41, 42	Sandy Savannah	Favorable	4,500	Little bluestem	25
		Normal	3,300	Big bluestem	20
		Unfavorable	2,500	Indiangrass	5
				Switchgrass	5
				Sand lovegrass	5
				Scribner panicum	5
				Purpletop	5
				Perennial sunflower	5
				Goldenrod	5
				Trees	15
				Other perennial grasses	5
[1]43:					
Stephenville part	Sandy Savannah	Favorable	4,500	Little bluestem	25
		Normal	3,300	Big bluestem	20
		Unfavorable	2,500	Indiangrass	5
				Switchgrass	5
				Sand lovegrass	5
				Scribner panicum	5
				Purpletop	5
				Perennial sunflower	5
				Goldenrod	5
				Trees	15
				Other pernnial grasses	5
Darnell part	Shallow Savannah	Favorable	3,200	Little bluestem	30
		Normal	2,100	Big bluestem	20
		Unfavorable	1,400	Indiangrass	5
				Switchgrass	5
				Side-oats grama	5
				Purpletop	5
				Scribner panicum	5
				Tall dropseed	5
				Hairy sunflower	5
				Trees	10
				Shrubs	5

See footnotes at end of table.

TABLE 6.--RANGE PRODUCTIVITY AND COMPOSITION--Continued

Soil name and map symbol	Range site name	Potential production			Common plant name	Composition
		Kind of year	Dry weight			
			Lbs/ acre			Pct
Teller:						
44	Loamy Prairie	Favorable	6,000		Little bluestem	25
		Normal	4,200		Big bluestem	20
		Unfavorable	3,000		Indiangrass	10
					Switchgrass	10
					Canada wildrye	5
					Side-oats grama	5
					Blue grama	5
					Tall dropseed	5
					Dotted gayfeather	5
					Slender lespedeza	3
					Roundhead lespedeza	2
					Trees	5
Tribbey:						
45	Wetland	Favorable	5,000		Switchgrass	25
		Normal	3,600		Bushy bluestem	25
		Unfavorable	3,000		Sedges	10
					Eastern gamagrass	5
					Indiangrass	5
					Big bluestem	5
					Beaked panicum	5
					Rushes	5
					Other shrubs	10
					Trees	5
Vanoss:						
46, 47	Loamy Prairie	Favorable	5,000		Little bluestem	25
		Normal	3,300		Big bluestem	20
		Unfavorable	2,200		Indiangrass	10
					Switchgrass	10
					Canada wildrye	5
					Side-oats grama	5
					Blue grama	5
					Tall dropseed	5
					Dotted gayfeather	5
					Slender lespedeza	3
					Roundhead lespedeza	2
					Trees	5
Vernon:						
48, 49	Red Clay Prairie	Favorable	1,750		Side-oats grama	25
		Normal	1,350		Buffalograss	15
		Unfavorable	900		Tobosa	15
					Vine-mesquite	5
					Hairy grama	5
					Silver bluestem	5
					Arizona cottontop	5
					Blue grama	5
					Other perennial grasses	10
					Other perennial forbs	5
					Other shrubs	5
[1]50:						
Vernon part	Red Clay Prairie	Favorable	1,750		Side-oats grama	25
		Normal	1,350		Buffalograss	15
		Unfavorable	900		Tobosa	15
					Vine-mesquite	5
					Hairy grama	5
					Silver bluestem	5
					Arizona cottontop	5
					Blue grama	5
					Other perennial grasses	10
					Other perennial forbs	5
					Other shrubs	5

See footnotes at end of table.

TABLE 6.--RANGE PRODUCTIVITY AND COMPOSITION--Continued

Soil name and map symbol	Range site name	Potential production		Common plant name	Composition
		Kind of year	Dry weight		
			Lbs/ acre		Pct
Vernon:					
[1]50:					
Port part	Loamy Bottomland	Favorable	8,500	Big bluestem	25
		Normal	6,100	Indiangrass	15
		Unfavorable	4,500	Switchgrass	15
				Little bluestem	10
				Eastern gamagrass	5
				Tall dropseed	5
				Beaked panicum	5
				Compassplant	5
				Heath aster	5
				Sedges	5
				Trees	5
Weatherford:					
51, 52	Sandy Savannah	Favorable	4,600	Little bluestem	25
		Normal	3,300	Big bluestem	20
		Unfavorable	2,500	Indiangrass	5
				Switchgrass	5
				Sand lovegrass	5
				Scribner panicum	5
				Purpletop	5
				Perennial sunflower	5
				Goldenrod	5
				Trees	15
				Other perennial grasses	5
[1]53	Eroded Sandy Savannah	Favorable	2,200	Little bluestem	30
		Normal	1,500	Indiangrass	10
		Unfavorable	1,100	Big bluestem	5
				Switchgrass	5
				Purpletop	5
				Tick clover	5
				Other perennial grasses	20
				Trees	10
				Other perennial forbs	10
Windthorst:					
54	Sandy Savannah	Favorable	4,500	Little bluestem	25
		Normal	3,300	Big bluestem	20
		Unfavorable	2,500	Indiangrass	5
				Switchgrass	5
				Sand lovegrass	5
				Scribner panicum	5
				Purpletop	5
				Perennial sunflower	5
				Goldenrod	5
				Trees	15
				Other perennial grasses	5
Yahola:					
55	Loamy Bottomland	Favorable	8,500	Big bluestem	25
		Normal	6,100	Indiangrass	15
		Unfavorable	4,500	Switchgrass	15
				Little bluestem	10
				Eastern gamagrass	5
				Tall dropseed	5
				Beaked panicum	5
				Compassplant	5
				Sedges	5
				Heath aster	5
				Trees	5

See footnotes at end of table.

TABLE 6.--RANGE PRODUCTIVITY AND COMPOSITION--Continued

Soil name and map symbol	Range site name	Potential production		Common plant name	Composition
		Kind of year	Dry weight		
			Lbs/ acre		Pct
Zaneis:					
56, 57----------	Loamy Prairie----------	Favorable	5,500	Little bluestem----------	25
		Normal	3,600	Big bluestem----------	20
		Unfavorable	2,500	Indiangrass----------	10
				Switchgrass----------	10
				Canada wildrye----------	5
				Side-oats grama----------	5
				Blue grama----------	5
				Tall dropseed----------	5
				Other perennial grasses-------	15

[1]This mapping unit is made up of two or more dominant kinds of soils. See mapping unit description for the composition and behavior of the whole mapping unit.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed in this table. Absence of an entry in a column means the information was not available]

Soil name and map symbol	Suitability group	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Important trees	Site index	
Asher: 1	3o4	Slight	Slight	Moderate	Moderate	Pecan Black walnut Green ash	--- --- ---	Bur oak, pecan, black walnut, green ash.
Fluvents: 14	3o4	Slight	Slight	Moderate	Moderate	Eastern cottonwood Pecan Green ash Black walnut	90 --- --- ---	Eastern cottonwood, black walnut, bur oak, pecan, green ash.
Gaddy: 15	3s6	Moderate	Slight	Severe	Moderate	Eastern cottonwood	88	Eastern cottonwood, American sycamore.
Gracemont: 17	3w4	Slight	Slight	Slight	Moderate	Eastern cottonwood	86	Eastern cottonwood.
Gracemore: 18	3w5	Slight	Slight	Slight	---	Eastern cottonwood	90	Eastern cottonwood.
Harjo: 20	4w6	Slight	Severe	Moderate	Moderate	Eastern cottonwood Green ash Bur oak	80 --- ---	Eastern cottonwood, green ash, bur oak.
Keokuk: 21	3o4	Slight	Slight	Moderate	Moderate	Pecan Black walnut Green ash	--- --- ---	Bur oak, pecan, black walnut, green ash.
Latanier: 27	2w6	Slight	Moderate	Moderate	---	Green ash Pecan Eastern cottonwood American sycamore	80 --- 110 ---	Eastern cottonwood, American sycamore.
Lela: 28	3w6	Slight	Moderate	Moderate	Moderate	Eastern cottonwood Black walnut Pecan	90 --- ---	Eastern cottonwood, green ash, bur oak, black walnut.
Port: 33, [1]34	3o4	Slight	Slight	Slight	Moderate	Eastern cottonwood Pecan Green ash Black walnut	90 --- --- ---	Eastern cottonwood, black walnut, bur oak, pecan, green ash.
Pulaski: 35	3o4	Slight	Slight	Moderate	Moderate	Eastern cottonwood Pecan Green ash Black walnut	90 --- --- ---	Eastern cottonwood, black walnut, bur oak, pecan, green ash.
Sayers: [1]38	2o6	Slight	Slight	Slight	Slight	Eastern cottonwood	100	Eastern cottonwood, black walnut.
Tribbey: 45	3w4	Slight	Moderate	Moderate	Moderate	Eastern cottonwood	90	Eastern cottonwood.

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Suitability group	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Important trees	Site index	
Vernon:								
[1]50:								
Vernon part.	None							
Port part--------	3o4	Slight	Slight	Slight	Moderate	Eastern cottonwood--	90	Eastern cottonwood,
						Pecan----------	---	black walnut,
						Green ash----------	---	bur oak,
						Black walnut--------	---	pecan,
								green ash.
Yahola:								
55----------	3o4	Slight	Slight	Moderate	Moderate	Eastern cottonwood--	90	Eastern cottonwood,
						Pecan----------	---	black walnut,
						Green ash----------	---	bur oak,
						Black walnut--------	---	pecan,
								green ash.

[1]This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION

[Only the soils suitable for production of commercial trees are listed in this table]

Soil name and map symbol	Potential production		Common plant name	Composition
	Kind of year	Dry weight		
		Lbs/acre		Pct
Asher:				
1----------	Favorable	4,300	Big bluestem----------	25
	Normal	3,100	Indiangrass----------	15
	Unfavorable	2,300	Switchgrass----------	15
			Little bluestem----------	10
			Other grasses----------	20
			Other shrubs----------	10
			Trees----------	10
Fluvents:				
14----------	Favorable	3,500	Big bluestem----------	25
	Normal	2,500	Indiangrass----------	15
	Unfavorable	1,800	Switchgrass----------	15
			Little bluestem----------	10
			Eastern gamagrass----------	5
			Tall dropseed----------	5
			Beaked panicum----------	5
			Compassplant----------	5
			Sedges----------	5
			Heath aster----------	5
			Trees----------	5
Gaddy:				
15----------	Favorable	2,000	Switchgrass----------	30
	Normal	1,500	Sand bluestem----------	15
	Unfavorable	1,000	Indiangrass----------	15
			Little bluestem----------	5
			Texas bluegrass----------	5
			Beaked panicum----------	5
			Purpletop----------	5
			Goldenrod----------	5
			Heath aster----------	5
			Maximilian sunflower----------	5
			Trees----------	5
Gracemont:				
17----------	Favorable	4,500	Switchgrass----------	25
	Normal	3,900	Big bluestem----------	20
	Unfavorable	3,500	Indiangrass----------	10
			Eastern gamagrass----------	10
			Canada wildrye----------	5
			Maximilian sunflower----------	5
			Other perennial grasses----------	20
			Trees----------	5
Gracemore:				
18----------	Favorable	4,500	Switchgrass----------	25
	Normal	3,800	Big bluestem----------	20
	Unfavorable	3,500	Indiangrass----------	10
			Eastern gamagrass----------	10
			Beaked panicum----------	10
			Canada wildrye----------	5
			Scribner panicum----------	5
			Purpletop----------	5
			Maximilian sunflower----------	5
			Trees----------	5

See footnote at end of table.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Potential production		Common plant name	Composition
	Kind of year	Dry weight		
		Lbs/acre		Pct
Harjo:				
20	Favorable	2,200	Bushy bluestem	20
	Normal	1,800	Willow	15
	Unfavorable	1,500	Eastern cottonwood	15
			Switchgrass	10
			Indiangrass	5
			Big bluestem	5
			Little bluestem	5
			Beaked panicum	5
			Sedges	5
			Cattail	5
			Trees	10
Keokuk:				
21	Favorable	4,300	Big bluestem	25
	Normal	3,200	Indiangrass	15
	Unfavorable	2,300	Switchgrass	15
			Little bluestem	10
			Eastern gamagrass	5
			Tall dropseed	5
			Florida paspalum	5
			Canada wildrye	5
			Maximilian sunflower	5
			Eastern cottonwood	5
			Trees	5
Latanier:				
27	Favorable	3,200	Switchgrass	20
	Normal	2,400	Western wheatgrass	10
	Unfavorable	1,800	Canada wildrye	10
			Tall dropseed	10
			Other perennial grasses	40
			Trees	10
Lela:				
28	Favorable	2,800	Big bluestem	25
	Normal	1,900	Switchgrass	15
	Unfavorable	1,300	Indiangrass	15
			Prairie cordgrass	10
			Western wheatgrass	5
			Tall dropseed	5
			Perennial sunflower	5
			Goldenrod	5
			Sedges	5
			Trees	10
Port:				
33, [1]34	Favorable	4,300	Big bluestem	25
	Normal	3,100	Indiangrass	15
	Unfavorable	2,300	Switchgrass	15
			Little bluestem	10
			Eastern gamagrass	5
			Tall dropseed	5
			Beaked panicum	5
			Compassplant	5
			Heath aster	5
			Sedges	5
			Trees	5

See footnotes at end of table.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Potential production		Common plant name	Composition
	Kind of year	Dry weight		
		Lbs/acre		Pct
Pulaski:				
35	Favorable	4,300	Big bluestem	25
	Normal	3,100	Indiangrass	15
	Unfavorable	2,300	Switchgrass	15
			Little bluestem	10
			Eastern gamagrass	5
			Tall dropseed	5
			Beaked panicum	5
			Compassplant	5
			Sedges	5
			Heath aster	5
			Trees	5
Sayers:				
[1]38	Favorable	2,200	Switchgrass	30
	Normal	1,500	Sand bluestem	15
	Unfavorable	1,00	Indiangrass	15
			Little bluestem	5
			Texas bluegrass	5
			Beaked panicum	5
			Purpletop	5
			Goldenrod	5
			Heath aster	5
			Maximilian sunflower	5
			Trees	5
Tribbey:				
45	Favorable	2,500	Switchgrass	25
	Normal	1,800	Bushy bluestem	25
	Unfavorable	1,500	Sedges	10
			Eastern gamagrass	5
			Indiangrass	5
			Big bluestem	5
			Beaked panicum	5
			Rushes	5
			Other shrubs	10
			Trees	5
Vernon:				
[1]50:				
Vernon part.				
Port part	Favorable	4,400	Big bluestem	25
	Normal	3,000	Indiangrass	15
	Unfavorable	2,200	Switchgrass	15
			Little bluestem	10
			Eastern gamagrass	5
			Tall dropseed	5
			Beaked panicum	5
			Compassplant	5
			Heath aster	5
			Sedges	5
			Trees	5
Yahola:				
55	Favorable	4,300	Big bluestem	25
	Normal	3,100	Indiangrass	15
	Unfavorable	2,300	Switchgrass	15
			Little bluestem	10
			Eastern gamagrass	5
			Tall dropseed	5
			Beaked panicum	5
			Compassplant	5
			Sedges	5
			Heath aster	5
			Trees	5

[1]This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

TABLE 9.--BUILDING SITE DEVELOPMENT

["Shrink-swell," "floods," and other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Asher: 1	Moderate: wetness, floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: low strength.
Aydelotte: 2, 3	Severe: too clayey.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.
Borrow Pits: 4.					
Carytown: 5	Severe: wetness, too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell, wetness.	Severe: low strengh, shrink-swell.	Severe: wetness, low strength, shrink-swell.
Chickasha: 6	Slight	Slight	Slight	Slight	Moderate: low strength.
7	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.
[1]8: Chickasha part	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.
Zaneis part	Slight	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength, slope.	Moderate: shrink-swell, low strength.
Chigley: [1]9	Severe: too clayey.	Severe: low strength.	Severe: low strength.	Severe: low strength.	Severe: low strength.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Galey: 16	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Moderate: low strength.
Gracemont: 17	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: floods.
Gracemore: 18	Severe: wetness, floods, cutbanks cave.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: floods.
Gravel Pits: 19.					
Harjo: 20	Severe: too clayey, wetness, floods.	Severe: wetness, floods, shrink-swell.	Severe: wetness, floods, shrink-swell.	Severe: wetness, floods, shrink-swell.	Severe: wetness, floods, shrink-swell.
Keokuk: 21	Moderate:	Severe:	Severe:	Severe:	Moderate:

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Norge:					
31	Moderate: too clayey.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Severe: low strength.
32	Moderate: too clayey.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell, slope.	Severe: low strength.
Port:					
33	Severe: floods.	Severe: floods.	Severe: floods	Severe: floods.	Moderate: floods, low strength, shrink-swell
134	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Pulaski:					
35	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods. low strength.
Renfrow:					
36, 37	Severe: too clayey.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.
Sayers:					
138	Severe: floods, cutbanks cave.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.
Seminole:					
39, 40	Severe: wetness, too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe low strength, shrink-swell.	Severe: low strength, shrink-swell.
Stephenville:					
41	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Slight	Moderate: low strength.
42	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: low strength.
143:					
Stephenville part	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, low strength.
Darnell part	Moderate: depth to rock, slope.	Moderate: depth to rock, slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: depth to rock, slope, low strength.
Teller:					
44	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.
Tribbey:					
45	Severe: floods, wetness.	Severe: floods.	Severe: wetness, floods.	Severe: floods.	Severe: floods.
Vanoss:					
46, 47	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: low strength, shrink-swell.

See footnotes at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Vernon:					
48, 49	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
[1]50:					
Vernon part	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
Port part	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Weatherford:					
51, 52	Slight	Slight	Slight	Slight	Moderate: low strength.
[1]53:					
Weatherford part	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.
Stephenville part	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: low strength.
Windthorst:					
54	Severe: too clayey.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.
Yahola:					
55	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: low strength, floods.
Zaneis:					
56	Slight	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.
57	Slight	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength, slope.	Moderate: shrink-swell, low strength.

[1]This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

TABLE 10.--SANITARY FACILITIES

["Percs slowly," "floods," and other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms used to rate soils. Absence of an entry means soil was not rated]

Soil name and	Septic tank absorption	Sewage lagoon	Trench sanitary	Area sanitary	Daily cover

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Gracemont: 17	Severe: wetness, floods.	Severe: wetness, seepage, floods.	Severe: floods, seepage, wetness.	Severe: wetness, floods, seepage.	Good.
Gracemore: 18	Severe: wetness, floods.	Severe: wetness, seepage, floods.	Severe: floods, too sandy, wetness.	Severe: wetness, floods, seepage.	Poor: too sandy.
Gravel Pits: 19.					
Harjo: 20	Severe: wetness, floods, percs slowly.	Severe: wetness, floods.	Severe: wetness, floods, too clayey.	Severe: wetness, floods.	Poor: too clayey, wetness.
Keokuk: 21	Moderate: floods.	Moderate: seepage.	Moderate: floods, seepage.	Moderate: floods.	Good.
Kirkland: 22	Severe: percs slowly.	Slight	Severe: too clayey.	Slight	Poor: thin layer, too clayey.
Konawa: 23	Slight	Severe: seepage.	Severe: seepage.	Slight	Fair: thin layer.
24, 25, 26	Slight	Severe: seepage.	Severe: seepage.	Slight	Good.
Latanier: 27	Severe: percs slowly, floods, wetness.	Severe: floods.	Severe: too clayey, floods, wetness.	Severe: floods, wetness.	Poor: too clayey.
Lela: 28	Severe: percs slowly, floods.	Slight	Severe: floods, too clayey.	Severe: floods.	Poor: too clayey.
Miller: 29	Severe: percs slowly, floods.	Severe: floods.	Severe: floods, too clayey.	Severe: floods.	Poor: too clayey, hard to pack.
Noble: 30	Slight	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Good.
Norge: 31, 32	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: thin layer.

See footnotes at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Port:					
33	Severe: floods.	Moderate: seepage.	Severe: floods.	Severe: floods.	Good.
34	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Good.
Pulaski:					
35	Severe: floods.	Severe: seepage, floods.	Severe: floods, seepage.	Severe: floods, seepage.	Good.
Renfrow:					
36, 37	Severe:	Moderate:	Severe:	Slight	Poor:

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Weatherford: 51, 52	Moderate: depth to rock.	Moderate: slope, seepage, depth to rock.	Moderate: depth to rock.	Slight	Fair: area reclaim.
[1]53: Weatherford part--	Moderate: depth to rock	Moderate: slope, seepage, depth to rock.	Moderate: depth to rock.	Slight	Fair: area reclaim.
Stephenville part-	Severe: depth to rock.	Severe: depth to rock, slope.	Moderate: depth to rock.	Slight	Fair: thin layer.
Windthorst: 54	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Yahola: 55	Severe: floods.	Severe: seepage, floods.	Severe: floods, seepage.	Severe: floods, seepage.	Good.
Zaneis: 56, 57	Severe: percs slowly.	Moderate: depth to rock, slope.	Moderate: too clayey, depth to rock.	Slight	Fair: thin layer.

[1]This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

TABLE 11.--CONSTRUCTION MATERIALS

["Shrink-swell" and other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor," and "unsuited." Absence of an entry means soil was not rated]

Soil name and map symbol	Road fill	Sand	Gravel	Topsoil
Asher: 1	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
Aydelotte: 2, 3	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
Borrow Pits: 4.				
Carytown: 5	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Chickasha: 6, 7	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
18: Chickasha part	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Zaneis part	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Chigley: 19	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, small stones.
Dougherty: 10, 11	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Poor: too sandy.
Eufaula: 12, 13	Good	Poor: excess fines.	Unsuite: excess fines.	Poor: too sandy.
Fluvents: 14	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Gaddy: 15	Good	Poor: excess fines.	Unsuited: excess fines.	Poor: too sandy.
Galey: 16	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines	Fair: thin layer.
Gracemont: 17	Fair: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Gracemore: 18	Fair: low strength, wetness.	Poor: excess fines.	Unsuited: excess fines.	Poor: too sandy.
Gravel Pits: 19.				

See footnotes at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Road fill	Sand	Gravel	Topsoil
Harjo: 20	Poor: wetness, shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey, wetness.
Keokuk: 21	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Kirkland: 22	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuite: excess fines.	Fair: thin layer.
Konawa: 23	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Poor: too sandy.
24, 25, 26	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Latanier: 27	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
Lela: 28	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
Miller: 29	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
Noble: 30	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Norge: 31, 32	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Port: 33	Fair: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
[1]34	Fair: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Pulaski: 35	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Good.
Renfrow: 36, 37	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Sayers: [1]38	Good	Poor: excess fines.	Unsuited: excess fines.	Poor: too sandy.

See footnotes at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Road fill	Sand	Gravel	Topsoil
Seminole 39, 40	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Stephenville: 41, 42	Fair: thin layer, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
143: Stephenville part	Fair: thin layer, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer.
Darnell part	Fair: low strength, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, slope.
Teller: 44	Good	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Tribbey: 45	Fair: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Vanoss: 46, 47	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Vernon: 48	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
49	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
150: Vernon part	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited excess fines.	Poor: too clayey.
Port part	Fair: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Weatherford: 51, 52	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
153: Weatherford part	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Stephenville part	Fair: thin layer, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Windthorst: 54	Fair: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Road fill	Sand	Gravel	Topsoil
Yahola: 55	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Good.
Zaneis: 56, 57	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.

[1]This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

TABLE 12.--WATER MANAGEMENT

["Seepage," "slope," and other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not evaluated]

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Asher: 1	Moderate: seepage.	Moderate: unstable fill, compressible, piping.	Floods	Slow intake	Favorable	Favorable.
Aydelotte: 2, 3	Slight	Moderate: unstable fill, compressible.	Not needed	Erodes easily, slow intake.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
Borrow Pits: 4.						
Carytown: 5	Slight	Moderate: unstable fill, compressible.	Percs slowly	Slow intake	Percs slowly	Percs slowly, excess sodium.
Chickasha: 6, 7	Moderate: depth to rock, seepage.	Moderate: thin layer.	Not needed	Erodes easily	Erodes easily	Erodes easily.
18: Chickasha part	Moderate: depth to rock, seepage.	Moderate: thin layer.	Not needed	Erodes easily	Erodes easily	Erodes easily.
Zaneis part	Moderate: seepage, depth to rock.	Moderate: thin layer, unstable fill, piping.	Not needed	Erodes easily	Erodes easily, percs slowly.	Erodes easily, percs slowly.
Chigley: 19	Moderate: depth to rock, seepage.	Moderate: unstable fill, compressible.	Not needed	Erodes easily, slow intake.	Erodes easily, percs slowly.	Percs slowly.
Dougherty: 10, 11	Severe: seepage,	Moderate: unstable fill, compressible, piping.	Favorable	Fast intake, seepage. erodes easily.	Erodes easily, too sandy.	Erodes easily, fast intake.
Eufaula: 12	Severe: seepage.	Moderate: unstable fill, piping.	Favorable	Seepage, fast intake, droughty.	Seepage, fast intake, droughty.	Erodes easily, droughty, fast intake.
13	Severe: seepage.	Moderate: unstable fill, piping.	Slope	Seepage, fast intake, droughty, slope.	Seepage, fast intake, droughty, slope.	Erodes easily, droughty, fast intake.
Fluvents: 14	Moderate: seepage.	Moderate: unstable fill, seepage.	Slope	Slope, erodes easily, floods.	Slope, erodes easily.	Slope.
Gaddy: 15	Severe: seepage.	Moderate: unstable fill, piping.	Floods	Seepage, floods, fast intake.	Erodes easily	Erodes easily.

See footnotes at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Galey: 16	Moderate: seepage.	Moderate: unstable fill, piping, compressible.	Favorable	Favorable	Favoable	Favorable.
Gracemont: 17	Severe: seepage.	Moderate: unstable fill, piping.	Floods	Wetness, seepage, floods.	Floods	Wetness, seepage.
Gracemore: 18	Severe: seepage.	Moderate: unstable fill, low strength.	Wetness, floods, cutbanks cave.	Wetness, seepage, floods.	Floods	Wetness, seepage.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Port: 33, 134	Moderate: seepage.	Moderate: unstable fill, compressible, piping.	Floods	Erodes easily	Floods	Erodes easily.
Pulaski: 35	Severe: seepage.	Moderate: unstable fill, seepage, piping.	Floods	Floods	Floods	Erodes easily.
Renfrow: 36, 37	Slight	Moderate: unstable fill, compressible.	Favorable	Erodes easily, slow intake.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
Sayers: 138	Severe: seepage	Moderate: unstable fill	Floods	Floods, seepage	Floods, erodes easily	Erodes easily, droughty

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Weatherford: 51, 52	Moderate: depth to rock, seepage.	Moderate: erodes easily, piping.	Favorable	Erodes easily	Erodes easily	Erodes easily.
[1]53: Weatherford part	Moderate: depth to rock, seepage.	Moderate: erodes easily, piping.	Slope	Erodes easily	Erodes easily	Erodes easily.
Stephenville part	Severe: depth to rock.	Moderate: thin layer.	Slope	Erodes easily	Erodes easily	Erodes easily.
Windthorst: 54	Moderate: seepage.	Moderate: compressible.	Percs slowly	Slow intake, erodes easily.	Percs slowly, erodes easily.	Percs slowly, erodes easily.
Yahola: 55	Severe: seepage.	Moderate: unstable fill, seepage, piping.	Floods	Floods	Floods	Not needed.
Zaneis: 56, 57	Moderate: seepage, depth to rock.	Moderate: thin layer, unstable fill, piping.	Favorable	Erodes easily	Erodes easily, percs slowly.	Erodes easily, percs slowly.

[1]This mapping unit is made up of two or more dominant kinds of soil. See mapping unit descripion for the composition and behavior of the whole mapping unit.

TABLE 13.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates the soil was not rated]

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
Asher: 1	Good	Good	Fair	Good	Good	Fair	Poor	Poor	Good	Good	Poor	Fair.
Aydelotte: 2	Good	Good	Good	---	---	Fair	Poor	Very poor.	Good	---	Very poor.	Fair.
3	Good	Good	Fair	---	---	Fair	Poor	Very poor.	Good	---	Very poor.	Fair.
Borrow Pits: 4.												
Carytown: 5	Poor	Fair	Fair	---	---	Fair	Good	Fair	Fair	---	Fair	Fair.
Chickasha: 6, 7	Good	Good	Good	---	---	Fair	Poor	Very poor.	Good	---	Very poor.	Fair.
[1]8: Chickasha part	Good	Good	Good	---	---	Fair	Poor	Very poor.	Good	---	Very poor.	Fair.
[illegible]	[illegible]	[illegible]	[illegible]			Fair	Poor	Very	Good	---	Very	Fair.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
Kirkland:												

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
Teller: 44	Good	Good	Good	---	---	Good	Poor	Very poor.	Good	---	Very poor.	Good.
Tribbey: 45	Poor	Fair	Fair	Good	Good	---	Good	Good	Fair	Good	Good	---
Vanoss: 46,47	Good	Good	Good	---	---	Good	Poor	Very poor.	Good	---	Very poor.	Good
Vernon: 48	Fair	Fair	Fair	---	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
49	Fair	Fair	Poor	---	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
[1]50: Vernon part	Fair	Fair	Poor	---	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair
Port part	Poor	Fair	Fair	---	---	Good	Poor	Very poor.	Fair	---	Very poor.	Fair
Weatherford: 51, 52	Good	Good	Good	---	---	Good	Poor	Very poor.	Good	---	Very poor.	Good
[1]53: Weatherford part	Fair	Good	Good	---	---	Good	Poor	Very poor.	Good	---	Very poor.	Good
Stephenville part	Fair	Good	Good	---	---	Good	Poor	Very poor.	Good	---	Very poor.	Good.
Windthorst: 54	Good	Good	Good	---	---	Fair	Poor	Very poor.	Good	---	Very poor.	Fair.
Yahola: 55	Good	Good	Good	---	---	Good	Poor	Very poor.	Good	---	Very poor.	Good
Zaneis: 56, 57	Good	Good	Good	---	---	Fair	Poor	Very poor.	Good	---	Very poor.	Fair.

[1]This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

TABLE 14.--RECREATIONAL DEVELOPMENT

["Percs slowly," "floods," and other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe"]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Asher: 1	Severe: floods.	Moderate: floods, too clayey.	Moderate: floods, percs slowly, too clayey.	Moderate: too clayey.
Aydelotte: 2	Severe: percs slowly.	Slight	Severe: percs slowly.	Slight.
3	Severe: percs slowly, too clayey.	Moderate: too clayey.	Severe: percs slowly, too clayey.	Moderate: too clayey.
Borrow Pits: 4.				
Carytown: 5	Severe: wetness.	Severe: wetness.	Severe; wetness.	Severe: wetness.
Chickasha: 6, 7	Slight	Slight	Moderate: slope.	Slight.
[1]8: Chickasha part	Slight	Slight	Moderate: slope.	Slight.
Zaneis part	Moderate: percs slowly.	Slight	Moderate: percs slowly, slope.	Slight.
Chigley: 9	Moderate: percs slowly, small stones.	Moderate: small stones.	Severe: small stones.	Slight.
Dougherty: 10, 11	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.
Eufaula: 12, 13	Moderate: too sandy.	Moderate: too sandy.	Severe: too sandy.	Severe: too sandy.
Fluvents: 14	Severe: floods.	Moderate: slope.	Severe: slope.	Slight.
Gaddy: 15	Severe: floods.	Moderate: floods.	Moderate: floods.	Moderate: floods.
Galey: 16	Slight	Slight	Slight	Slight.
Gracemont: 17	Severe: floods, wetness.	Severe: floods.	Severe: floods.	Moderate: floods, wetness.
Gracemore: 18	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: wetness, floods.

See footnotes at end of table.

TABLE 14.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Gravel Pits: 19.				
Harjo: 20	Severe: too clayey, wetness, floods.	Severe: floods, too clayey, wetness.	Severe: wetness, floods, percs slowly.	Severe: wetness, floods, too clayey.
Keokuk: 21	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight.
Kirkland: 22	Severe: percs slowly.	Slight	Severe: percs slowly.	Slight.
Konawa: 23	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.
24	Slight	Slight	Slight	Slight.
25, 26	Slight	Slight	Moderate: slope.	Slight.
Latanier: 27	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: too clayey.
Lela: 28	Severe: floods, percs slowly, too clayey.	Severe: too clayey.	Severe: percs slowly, too clayey.	Severe: too clayey.
Miller: 29	Severe: floods, percs slowly, too clayey.	Moderate: floods.	Severe: percs slowly.	Moderate: too clayey.
Noble: 30	Slight	Slight	Moderate: slope.	Slight.
Norge: 31, 32	Moderate: percs slowly.	Slight	Moderate: percs slowly, slope.	Slight.
Port: 33	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight.
[1]34	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.
Pulaski: 35	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight.
Renfrow: 36, 37	Severe: percs slowly.	Slight	Severe: slope, percs slowly.	Slight.

See footnotes at end of table.

TABLE 14.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Sayers: [1]38	Severe: floods.	Moderate: floods, too sandy.	Moderate: floods, too sandy.	Moderate. floods, too sandy.
Seminole: 39, 40	Moderate: percs slowly.	Slight	Moderate: percs slowly, slope.	Slight.
Stephenville: 41, 42	Slight	Slight	Moderate: slope.	Slight.
[1]43: Stephenville part	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Darnell part	Moderate: slope.	Moderate: slope.	Severe: depth to rock, slope.	Slight.
Teller: 44	Slight	Slight	Moderate: slope.	Slight.
Tribbey: 45	Severe: wetness,	Severe: floods.	Severe: floods,	Moderate: wetness,

TABLE 14.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Windthorst: 54	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.
Yahola: 55	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight.
Zaneis: 56, 57	Moderate: percs slowly.	Slight	Moderate: percs slowly, slope.	Slight.

[1]This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

[redacted]

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments >3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments >3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Dougherty:											
10, 11	0-23	Loamy fine sand	SM	A-2	0	100	98-100	90-100	15-35	---	NP
	23-40	Fine sandy loam, sandy clay loam.	ML, SM, CL, SC	A-4, A-6	0	100	98-100	90-100	36-65	<37	NP-16
	40-72	Fine sandy loam, sandy clay loam, loamy fine sand.	SM, ML, CL, SC	A-4, A-6 A-2	0	100	98-100	90-100	15-65	<37	NP-16
Eufaula:											
12, 13	0-72	Fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	98-100	82-100	5-35	---	NP
Fluvents:											
14	0-60	Very fine sandy loam, loam, silt loam, fine sandy loam.	SM, ML, SC, CL	A-4	0	100	98-100	94-100	36-95	<31	NP-10
Gaddy:											
15	0-8	Loamy fine sand	SM	A-2	0	100	98-100	90-100	15-35	---	NP
	8-60	Loamy fine sand, fine sand.	SM	A-2, A-4	0	100	98-100	90-100	15-36	---	NP
Galey:											
16	0-12	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-4	0	100	98-100	94-100	40-60	<25	NP-6
	12-65	Sandy clay loam, fine sandy loam, clay loam.	SM-SC, SC, CL-ML, CL	A-4, A-6	0	100	98-100	90-100	40-65	26-40	6-18
Gracemont:											
17	0-10	Fine sandy loam	ML, SM	A-4,	0	100	98-100	94-100	36-60	<25	NP-4
	10-60	Fine sandy loam, loam.	ML, CL, SM	A-4	0	100	98-100	94-100	36-60	<25	NP-4
Gracemore:											
18	0-10	Fine sand-------	SM, SP-SM	A-2, A-3	0	100	98-100	82-98	5-25	---	NP
	10-72	Fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	98-100	82-100	5-35	---	NP
Gravel Pits:											
19.											
Harjo:											
20	0-10	Clay----------	CH, CL	A-7	0	98-100	98-100	90-100	75-90	45-60	22-35
	10-36	Stratified clay to clay loam.	CH, CL	A-7	0	98-100	98-100	90-100	75-99	44-60	21-35
	36-65	Stratified clay to very fine sandy loam.	CH, CL, ML	A-7, A-6, A-4	0	98-100	98-100	85-100	51-99	30-60	9-35
Keokuk:											
21	0-65	Silt loam, loam, very fine sandy loam.	ML, CL, CL-ML	A-4	0	100	100	94-100	51-97	<30	NP-10
Kirkland:											
22	0-13	Silt loam-------	CL, ML,	A-4, A-6	0	100	100	96-100	76-98	25-40	4-19
	13-48	Silty clay, clay	CL, CH, MH	A-7	0	100	100	96-100	81-99	41-65	18-38
	48-82	Clay, silty clay, clay loam.	CL, CH, MH	A-6, A-7	0	100	100	96-100	73-99	37-65	15-38

See footnotes at end of table.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments >3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Konawa:											
23----------	0-14	Loamy fine sand	SM	A-2	0	98-100	98-100	85-100	15-35	---	NP
	14-38	Sandy clay loam, fine sandy loam.	SC, CL	A-4, A-6	0	98-100	98-100	85-100	40-60	26-40	8-18
	38-70	Fine sandy loam, sandy clay loam, loamy fine sand.	SP-SC	A-2, A-4 A-6	0	98-100	98-100	85-100	15-60	<34	NP-14
24, 25, 26--------	0-10	Fine sandy loam	SP-SM	A-4	0	98-100	98-100	90-100	40-60	<26	NP-7
	10-36	Sandy clay loam, fine sandy loam.	SC, CL	A-4, A-6	0	98-100	98-100	85-100	40-60	26-40	8-18
	36-60	Fine sandy loam, sandy clay loam, loamy fine sand.	SP-SC SM	A-4, A-6, A-2	0	98-100	98-100	85-100	15-60	21-34	NP-14
Latanier:											
27----------	0-8	Silty clay loam	CL	A-6, A-7	0	100	100	100	95-100	35-50	11-25
	8-23	Clay, silty clay	CH, MH	A-7	0	100	100	100	95-100	51-75	25-40
	23-72	Loam, very fine sandy loam.	CL-ML, CL, ML	A-4	0	100	98-100	94-100	55-85	<30	NP-10
Lela:											
28----------	0-24	Silty clay------	CL, MH, CH	A-7	0	100	100	96-100	90-99	41-70	20-38
	24-72	Silty clay, clay	CL, MH, CH	A-7	0	100	100	96-100	90-99	41-70	20-38
Miller:											
29----------	0-12	Clay loam-------	CL, CH	A-6, A-7	0	100	98-100	96-100	80-99	35-50	16-27
	12-96	Clay------------	CL, CH	A-7	0	100	98-100	96-100	90-99	41-65	20-40
Noble:											
30----------	0-60	Fine sandy loam	ML, CL, SM, SC	A-4	0	100	98-100	94-100	36-65	<30	NP-10
Norge:											
31, 32------------	0-18	Loam, silty clay loam.	ML, CL	A-4, A-6	0	100	100	96-100	65-98	22-35	2-15
	18-60	Silty clay loam, clay loam.	CL	A-6, A-7	0	100	100	96-100	75-98	33-43	12-20
Port:											
33----------	0-30	Loam------------	ML, CL	A-4, A-6	0	100	98-100	94-100	65-98	22-37	2-14
	30-65	Silty clay loam, clay loam, loam.	ML, CL	A-4, A-6, A-7	0	100	100	96-100	65-98	27-43	8-20
134----------	0-23	Loam, fine sandy loam, silt loam	ML, CL, SM, SC	A-4, A-6	0	100	100	94-100	45-98	22-37	2-14
	23-72	Silty clay loam, clay loam, loam.	ML, CL	A-4, A-6, A-7	0	100	100	96-100	65-98	27-43	8-20

See footnotes at end of table.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments >3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Pulaski:											
35	0-18	Fine sandy loam	SM, SC, ML, CL	A-4	0	100	95-100	90-100	36-60	<30	NP-10
	18-50	Fine sandy loam, loam.	SM, SC, ML, CL	A-4	0	100	95-100	90-100	36-60	<30	NP-10
	50-60	Loam	ML, SL, ML, CL	A-4	0	100	95-100	90-100	60-85	<30	NP-10
Renfrow:											
36, 37	0-9	Silt loam	ML, CL	A-4, A-6	0	100	100	96-100	65-97	30-37	8-14
	9-13	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	96-100	80-98	37-49	15-26
	13-75	Clay, silty clay, silty clay loam.	ML, CL, CH, MH	A-6, A-7	0	100	100	96-100	80-99	37-70	15-38
Sayers:											
38	0-16	Loamy fine sand, fine sand.	SM, SP-SM	A-2, A-3	0	100	09-100	90-100	5-35	---	NP
	16-60	Loamy fine sand	SM, SP-SM	A-2, A-3	0	100	98-100	82-100	5-35	---	NP
Seminole:											
39, 40	0-14	Loam	ML, CL, CL-ML	A-4, A-6	0	100	100	96-100	61-97	20-37	1-15
	14-20	Loam, clay loam, silt loam.	CL	A-6, A-7	0	98-100	98-100	94-100	75-98	33-43	13-20
	20-72	Clay, silty clay, clay loam.	CL, CH, ML, MH	A-7, A-6	0	98-100	98-100	94-100	75-98	37-65	15-35
Stephenville:											
41, 42	0-12	Fine sandy loam	SM, SC, ML, CL	A-4	0	100	98-100	94-100	36-60	<30	NP-10
	12-34	Fine sandy loam, sandy clay loam.	SC, CL	A-4, A-6	0	100	98-100	90-100	36-65	25-37	8-16
	34-42	Weathered bedrock.									
43:											
Stephenville part	0-12	Fine sandy loam	SM	A-4	0	100	98-100	94-100	36-60	<30	NP-10
	12-30	Fine sandy loam, sandy clay loam.	SC, CL	A-4, A-6	0	100	98-100	90-100	36-65	25-37	8-16
	30-36	Weathered bedrock.									
Darnell part	0-5	Fine sandy loam	SM, SC, ML, CL	A-4	0-5	90-100	90-100	85-100	36-60	<30	NP-10
	5-14	Fine sandy loam, loam.	SM, SC, ML, CL	A-4	0-8	70-100	70-100	60-100	36-60	<30	NP-10
	14-18	Weathered bedrock.									
Teller:											
44	0-18	Fine sandy loam	SM, SC, ML, CL	A-4	0	100	100	94-100	36-60	<30	NP-10
	18-36	Sandy clay loam	SC, CL	A-6, A-4	0	100	100	90-100	36-65	25-37	7-16
	36-60	Fine sandy loam	SM, SC,	A-4,	0	100	100	94-100	36-60	<30	NP-10

See footnotes at end of table.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

		Classification	Frag-	Percentage passing		Plas-

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments >3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Weatherford:											
[1]53----------	0-5	Fine sandy loam	SM, ML, SM-SC, CL-ML	A-4	0	95-100	95-100	75-90	36-60	<25	NP-7
	5-24	Sandy clay loam	CL, SC	A-6	0	95-100	95-100	80-100	36-60	30-40	15-24
	24-58	Sandy clay loam, fine sandy loam	SC, CL	A-4, A-6	0	95-100	95-100	80-100	40-65	20-40	8-20
	58-62	Weathered bedrock.									
Stephenville part	0-6	Fine sandy loam	SM, ML, SM-SC, CL-ML	A-4	0	95-100	95-100	75-90	36-60	<25	NP-7
	6-28	Fine sandy loam, sandy clay loam.	SC, CL	A-4, A-6	0	100	98-100	90-100	36-65	25-37	7-16
	28-38	Weathered bedrock.									
Windthorst:											
54----------	0-10	Fine sandy loam	SM, ML, SM-SC,	A-4	0	95-100	95-100	75-100	36-60	<25	3-7
	10-45	Clay, sandy clay	CH, CL	A-7, A-6	0	95-100	95-100	85-100	51-90	35-55	15-3
	45-60	Weathered bedrock.									
Yahola:											
55----------	0-11	Fine sandy loam	SM, SC, ML, CL	A-4	0	100	95-100	90-100	36-85	<30	NP-10
	11-40	Fine sandy loam, loam.	SM, SC, ML, CL	A-4	0	100	95-100	90-100	36-85	<30	NP-10
	40-72	Fine sandy loam, loam, loamy fine sand.	SM, SC, ML, CL	A-4, A-2	0	100	95-100	90-100	15-85	<30	NP-10
Zaneis:											
56, 57----------	0-9	Loam----------	ML, CL-ML	A-4	0	100	100	94-100	60-70	<26	NP-6
	9-52	Loam, clay loam, sandy clay loam.	SC, CL, CL-ML, SM-SC	A-4, A-6	0	100	100	90-100	36-90	25-40	7-18
	52-60	Weathered bedrock.									

[1]This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[Dashes indicate data were not available. The symbol < means less than; > means greater than. The erosion tolerance factor (T) is for the entire profile. Absence of an entry means data were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors		Wind erodibility group
						Uncoated steel	Concrete	K	T	
	In	In/hr	In/in	pH						
Asher:										
1----------	0-21	0.06-0.2	0.18-0.22	6.1-8.4	Moderate	High-----	Low------	0.37	5	---
	21-65	0.6-2.0	0.13-0.24	7.4-8.4	Low-------	Low------	Low------	0.43		
Aydelotte:										
2----------	0-6	0.6-2.0	0.15-0.20	6.1-7.3	Low-------	Low------	Low------	0.49	4	---
	6-63	<0.06	0.12-0.18	6.1-8.4	High------	High-----	Low------	0.37		
3----------	0-4	0.2-0.6	0.15-0.20	6.1-7.3	Moderate	Moderate	Low------	0.43	4	---
	4-63	<0.06	0.12-0.18	6.1-8.4	High------	High-----	Low------	0.37		
Borrow Pits:										
4.										
Carytown:										
5----------	0-11	0.6-2.0	0.16-0.24	5.6-7.3	Low-------	Moderate	Low------	0.43	3	---
	11-70	<0.06	0.09-0.13	6.1-8.4	High------	High-----	Low------	0.49		
Chickasha:										
6, 7----------	0-14	2.0-6.0	0.13-0.17	5.6-7.3	Low-------	Low------	Moderate	0.28	4	---
	14-36	0.6-2.0	0.14-0.18	5.6-7.3	Low-------	Moderate	Moderate	0.28		
	36-53	0.6-2.0	0.13-0.17	5.6-8.4	Low-------	Moderate	Moderate	0.28		
	53-65									
[1]8:										
Chickasha part---	0-12	2.0-6.0	0.13-0.17	5.6-7.3	Low-------	Low------	Moderate	0.28	4	---
	12-30	0.6-2.0	0.14-0.18	5.6-7.3	Low-------	Moderate	Moderate	0.28		
	30-42	0.6-2.0	0.13-0.17	5.6-8.4	Low-------	Moderate	Moderate	0.28		
	42-50									
Zaneis part------	0-7	0.6-2.0	0.11-0.20	5.6-6.5	Low-------	Low------	Low------	0.28	4	---
	7-45	0.2-0.6	0.12-0.20	5.6-7.8	Moderate	Moderate	Low------	0.32		
	45-55	0.2-2.0	0.11-0.20	6.1-7.8	Moderate	Moderate	Low------	0.32		
	55-60									
Chigley:										
[1]9----------	0-16	2.0-6.0	0.09-0.13	5.6-7.3	Low-------	Moderate	Low------	0.37	4	---
	16-42	0.2-0.6	0.14-0.18	5.1-7.8	Moderate	High-----	Moderate	0.28		
	42-60	0.2-0.6	0.12-0.16	7.9-8.4	Moderate	High-----	Moderate	0.28		
Dougherty:										
10, 11----------	0-23	2.0-6.0	0.07-0.11	5.6-6.5	Low-------	Low------	Moderate	0.20	5	2
	23-40	0.6-2.0	0.11-0.17	5.1-6.0	Low-------	Low------	Moderate	0.32		

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors		Wind erodibility group
						Uncoated steel	Concrete	K	T	
	In	In/hr	In/in	pH						
Harjo:										
20	0-10	<0.06	0.14-0.18	7.4-8.4	High	High	Low	0.37	5	---
	10-36	<0.06	0.14-0.18	7.9-8.4	High	High	Low	0.37		
	36-65	0.06-2.0	0.10-0.18	7.9-8.4	High	High	Low	0.37		
Keokuk:										
21	0-65	0.6-2.0	0.15-0.20	6.1-8.4	Low	Low	Low	0.37	5	---
Kirkland:										
22	0-13	0.6-2.0	0.15-0.24	6.1-7.3	Low	Low	Low	0.43	5	---
	13-48	<0.06	0.12-0.18	6.6-7.8	High	High	Low	0.37		
	48-82	0.2-0.6	0.12-0.22	7.9-8.4	High	High	Low	0.37		
Konawa:										
23	0-14	6.0-20.0	0.06-0.10	5.6-6.5	Low	Low	Moderate	0.17	5	2
	14-38	0.6-2.0	0.12-0.16	5.1-6.0	Low	Moderate	Moderate	0.32		
	38-70	2.0-20.0	0.07-0.17	5.1-7.3	Low	Low	Moderate	0.24		
24, 25, 26	0-10	2.0-6.0	0.11-0.15	5.6-6.5	Low	Low	Moderate	0.24	5	---
	10-36	0.6-2.0	0.12-0.16	5.1-6.0	Low	Moderate	Moderate	0.32		
	36-60	2.0-20.0	0.07-0.15	5.1-7.3	Low	Low	Moderate	0.24		
Latanier:										
27	0-8	0.06-0.2	0.20-0.22	6.6-8.4	Moderate	High	Low	0.37	5	---
	8-23	<0.06	0.14-0.18	7.4-8.4	Very high	High	Low	0.37		
	23-72	0.06-2.0	0.18-0.20	7.9-8.4	Moderate	High	Low	0.37		
Lela:										
28	0-24	<0.06	0.12-0.18	6.1-7.8	High	High	Low	0.37	4	---
	24-72	<0.06	0.12-0.18	7.9-8.4	High	High	Low			
Miller:										
29	0-12	0.06-0.2	0.16-0.20	7.4-8.4	High	High	Low	0.37	5	---
	12-96	<0.06	0.15-0.19	7.4-8.4	High	High	Low	0.37		
Noble:										
30	0-60	2.0-6.0	0.11-0.15	5.6-6.5	Low	Low	Low	0.24	5	---
Norge:										
31, 32	0-18	0.6-2.0	0.15-0.24	5.6-7.3	Low	Moderate	Low	0.32	5	---
	18-60	0.2-0.6	0.15-0.22	5.6-8.4	Moderate	Moderate	Low	0.32		
Port:										
33	0-30	0.6-2.0	0.15-0.20	5.6-7.8	Low	Low	Low	0.32	5	---
	30-65	0.6-2.0	0.15-0.24	6.1-8.4	Moderate	Moderate	Low	0.32		
[1]34	0-23	0.6-2.0	0.15-0.24	5.6-7.8	Low	Low	Low	0.32	5	---
	23-72	0.6-2.0	0.15-0.24	6.1-8.4	Moderate	Moderate	Low	0.32		
Pulaski:										
35	0-18	2.0-6.0	0.12-0.16	5.6-7.3	Low	Low	Moderate	0.20	5	---
	18-50	2.0-6.0	0.12-0.16	5.6-7.8	Low	Low	Moderate			
	50-60	2.0-6.0	0.07-0.16	6.6-7.8	Low	Low	Low			
Renfrow:										
36, 37	0-9	0.6-2.0	0.15-0.24	6.1-7.3	Low	Low	Low	0.37	5	---
	9-13	0.2-0.6	0.15-0.22	6.1-7.3	Moderate	Moderate	Low			
	13-75	<0.06	0.12-0.22	6.1-8.4	High	High	Low			
Sayers:										
[1]38	0-16	2.0-20.0	0.07-0.10	6.6-7.8	Low	Low	Low	0.17	5	2
	16-60	2.0-20.0	0.05-0.10	7.4-7.8	Low	Low	Low	0.17		
Seminole:										
39, 40	0-14	0.6-2.0	0.15-0.20	5.6-7.3	Low	Moderate	Moderate	0.43	5	---
	14-20	0.2-0.6	0.15-0.20	5.6-7.3	Moderate	Moderate	Moderate	0.37		
	20-72	0.06-0.2	0.15-0.20	5.6-8.4	High	High	Moderate	0.32		

See footnotes at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors		Wind erodibility group
						Uncoated steel	Concrete	K	T	
	In	In/hr	In/in	pH						
Stephenville:										
41, 42	0-12	2.0-6.0	0.11-0.15	5.1-6.5	Low	Low	Moderate	0.24	3	---
	12-34	0.6-2.0	0.11-0.17	5.1-6.0	Low	Moderate	Moderate	0.32		
	34-42									
[1]43:										
Stephenville part	0-12	2.0-6.0	0.11-0.15	5.1-6.5	Low	Low	Moderate	0.24	3	
	12-30	0.6-2.0	0.11-0.17	5.1-6.0	Low	Moderate	Moderate	0.32		
	30-36									
Darnell part	0-5	2.0-6.0	0.12-0.16	5.1-7.3	Low	Low	Moderate	0.24	2	---
	5-14	2.0-6.0	0.12-0.16	5.1-7.3	Low	Low	Moderate	0.24		
	14-18									
Teller:										
44	0-18	2.0-6.0	0.12-0.15	5.6-6.5	Low	Low	Moderate	0.28	5	---
	18-36	0.6-2.0	0.14-0.18	5.6-6.5	Low	Low	Moderate	0.32		
	36-60	2.0-6.0	0.13-0.15	5.6-7.3	Low	Low	Moderate	0.20		
Tribbey:										
45	0-10	2.0-6.0	0.11-0.15	5.6-8.4	Low	Moderate	Low	0.20	5	---
	10-40	2.0-6.0	0.11-0.16	5.6-8.4	Low	Moderate	Low	0.20		
	40-50	2.0-6.0	0.10-0.15	5.6-8.4	Low	Moderate	Low	0.20		
	50-65	0.6-6.0	0.14-0.20	6.6-8.4	Low	High	Low	0.32		
Vanoss:										
46, 47	0-11	0.6-2.0	0.15-0.20	5.1-6.5	Low	Low	Low	0.32	5	---
	11-15	0.6-2.0	0.16-0.21	5.6-6.5	Low	Low	Low	0.37		
	15-37	0.6-2.0	0.17-0.22	5.6-6.5	Moderate	Moderate	Moderate	0.32		
	37-50	0.6-2.0	0.16-0.21	5.6-7.3	Low	Moderate	Moderate	0.37		
	50-80	0.6-2.0	0.13-0.21	5.6-7.3	Low	Moderate	Moderate	0.32		
Vernon:										
48	0-5	0.06-0.2	0.13-0.17	7.4-8.4	High	High	Low	0.37	2	---
	5-34	<0.06	0.13-0.17	7.9-8.4	High	High	Low	0.37		
	34-60	<0.06	0.08-0.10	7.9-8.4	High	High	Low			
49	0-5	<0.06	0.13-0.17	7.4-8.4	High	High	Low	0.37	2	---
	5-30	<0.06	0.13-0.17	7.9-8.4	High	High	Low	0.37		
	30-60	<0.06	0.08-0.10	7.9-8.4	High	High	Low			
[1]50:										
Vernon part	0-5	<0.06	0.13-0.17	7.4-8.4	High	High	Low	0.37	2	---
	5-30	<0.06	0.13-0.17	7.9-8.4	High	High	Low	0.37		
	30-60	<0.06	0.08-0.10	7.9-8.4	High	High	Low			
Port part	0-24	0.6-2.0	0.15-0.24	5.6-7.8	Moderate	Moderate	Low	0.32	5	---
	24-60	0.6-2.0	0.15-0.24	6.1-8.4	Moderate	Moderate	Low	0.32		
Weatherford:										
51, 52	0-12	2.0-6.0	0.11-0.15	6.1-7.3	Low	Low	Low	0.43	3	---
	12-18	0.6-2.0	0.12-0.16	5.6-6.5	Low	Low	Moderate	0.49		
	18-52	0.6-2.0	0.10-0.15	5.6-6.5	Low	Low	Moderate	0.49		
	52-60									
[1]53:										
Weatherford part	0-5	2.0-6.0	0.11-0.15	6.1-7.3	Low	Low	Low	0.43	3	---
	5-24	0.6-2.0	0.12-0.16	5.6-6.3	Low	Low	Moderate	0.49		
	24-58	0.6-2.0	0.10-0.15	5.6-6.5	Low	Low	Moderate	0.49		
	58-62									
Stephenville part	0-6	2.0-6.0	0.11-0.15	5.1-6.5	Low	Low	Moderate	0.24	3	---
	6-28	0.6-2.0	0.11-0.17	5.1-6.0	Low	Moderate	Moderate	0.32		
	28-38									

See footnotes at end of table.

[redacted]

TABLE 17.--SOIL AND WATER FEATURES

[Absence of an entry indicates the feature is not a concern. The symbol < means less than; > means greater than]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness
Asher: 1	C	Rare	Very brief	Mar-Aug	>6.0	---	---	>60	---
Aydelotte: 2, 3	D	None	---	---	>6.0	---	---	>60	---
Borrow Pits:									
Carytown: 5	D	None	---	---	1.0	Perched	Mar-May	>60	--
Chickasha: 6, 7	B	None	---	---	>6.0	---	---	40-60	Rippable
18: Chickasha part	B	None	---	---	>6.0	---	---	40-60	Rippable
Zaneis part	B	None	---	---	>6.0	---	---	40-60	Rippable
Chigley: 19	C	None	---	---	3.0	Perched	Feb-May	40-70	Rippable
Dougherty: 10, 11	A	None	---	---	>6.0	---	---	>60	---
Eufaula: 12, 13	A	None	---	---	>6.0	---	---	>60	---
Fluvents: 14	B	Occasional	Very brief	Apr-Oct	>6.0	---	---	>60	---
Gaddy: 15	A	Occasional	Very brief	Mar-Aug	>6.0	---	---	>60	---
Galey: 16	B	None	---	---	4.0-6.0	Perched	Mar-May	>60	---
Gracemont: 17	B	Frequent	Very brief to brief.	Mar-Aug	0.5-3.0	Apparent	Nov-May	>60	---
Gracemore: 18	C	Frequent	Very brief	Apr-Aug	0.5-3.0	Apparent	Nov-May	>60	---
Gravel Pits: 19.									
Harjo: 20	D	Frequent	Very long	Oct-Jun	1.0	Apparent	Oct-Jun	>60	---
Keokuk: 21	B	Rare	Very brief	Mar-Aug	>6.0	---	---	>60	---
Kirkland: 22	D	None	---	---	>6.0	---	---	>60	---
Konawa: 23, 24, 25, 26	B	None	---	---	>6.0	---	---	>60	---
Latanier: 27	D	Occasional	Brief	Nov-May	2.0-3.0	Apparent	Dec-Apr	>60	---

See footnotes at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness
Lela: 28	D	Occasional	Very brief	Apr-Oct	>6.0	---	---	>60	---
Miller: 29	D	Occasional	Brief	Mar-May	>6.0	---	---	>60	---
Noble: 30	B	None	---	---	>6.0	---	---	>60	---
Norge: 31, 32	B	None	---	---	>6.0	---	---	>60	---
Port: 33	B	Occasional	Very brief	Mar-Aug	>6.0	---	---	>60	---

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness
Weatherford: [1]53:									
Weatherford part	B	None	---	---	>6.0	---	---	20-40	Ripable.
Stephenville part	B	None	---	---	>6.0	---	---	20-40	Ripable
Windthorst: 54	C	None	---	---	>6.0	---	---	40-50	Ripable
Yahola: 55	B	Occasional	Very brief	Mar-Aug	>6.0	---	---	>60	---
Zaneis: 56, 57	B	None	---	---	>6.0	---	---	40-60	Ripable

[1]This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

Association of State

Plasticity index[3]	Classification AASHTO[4]	Classification Unified 5/
18	A-6(11)	CL
29	A-7-6(17)	CL
29	A-7-6(17)	CL
NP	A-2-3(0)	SM
NP	A-4(0)	SM
21	A-7-6(13)	CL
23	A-7-6(14)	CL
5	A-4(8)	CL-ML
NP	A-4(7)	ML
NP	A-4(8)	ML
4	A-4(8)	ML-CL
29	A-7-6(18)	CH
31	A-7-6(18)	CH
29	A-7-6(18)	CL
24	A-7-6(13)	CL
NP	A-4(4)	ML
13	A-6(5)	CL
8	A-4(1)	SC
4	A-2(0)	SC-SM
29	A-7-6(19)	CH
39	A-7-5(20)	CH-MH
16	A-6(9)	CL
25	A-7-6(16)	CL
29	A-7-6(18)	CH

Plasticity index3	Classification	
	AASHTO4	Unified 5
6	A-4(5)	ML-CL
25	A-7-6(15)	CL
25	A-7-6(15)	CL
27	A-7-6(16)	CL
28	A-7-6(18)	MH-CH
37	A-7-6(20)	CH
NP	A-2-3(0)	SM
NP	A-2-3(0)	SM

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TABLE 19.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Asher	Fine-silty, mixed, thermic Fluventic Haplustolls
Aydelotte	Fine, mixed, thermic Udertic Paleustalfs
Carytown	Fine, mixed, thermic Albic Natraqualfs
Chickasha	Fine-loamy, mixed, thermic Udic Argiustolls
Chigley	Fine, mixed, thermic Udic Paleustalfs
Darnell	Loamy, siliceous, thermic, shallow Udic Ustochrepts
Dougherty	Loamy, mixed, thermic Arenic Haplustalfs
Eufaula	Sandy, siliceous, thermic Psammentic Paleustalfs
Gaddy	Sandy, mixed, thermic Typic Ustifluvents
Galey	Fine-loamy, mixed, thermic Ultic Paleustalfs
Gracemont	Coarse-loamy, mixed (calcareous), thermic Aquic Udifluvents
Gracemore	Sandy, mixed, thermic Aquic Udifluvents
Harjo	Fine, mixed (calcareous), thermic Typic Fluvaquents
Keokuk	Coarse-silty, mixed, thermic Fluventic Haplustolls
Kirkland	Fine, mixed, thermic Udertic Paleustolls
Konawa	Fine-loamy, mixed, thermic Ultic Haplustalfs
Latanier	Clayey over loamy, mixed, thermic Vertic Hapludolls
Lela	Fine, mixed, thermic Typic Chromuderts
Miller	Fine, mixed, thermic Vertic Haplustolls
Noble	Coarse-loamy, siliceous, thermic Udic Ustochrepts
Norge	Fine-silty, mixed, thermic Udic Paleustolls
Port	Fine-silty, mixed, thermic Cumulic Haplustolls
Pulaski	Coarse-loamy, mixed, nonacid, thermic Typic Ustifluvents
Renfrow	Fine, mixed, thermic Udertic Paleustolls
Sayers	Sandy, mixed, thermic Typic Ustifluvents
Seminole	Fine, mixed, thermic Glossic Natrustolls
Stephenville	Fine-loamy, siliceous, thermic Ultic Haplustalfs
Teller	Fine-loamy, mixed, thermic Udic Argiustolls
Tribbey	Coarse-loamy, mixed, nonacid, thermic Aquic Udifluvents
Vanoss	Fine-silty, mixed, thermic Udic Argiustolls
Vernon	Fine, mixed, thermic Typic Ustochrepts
Weatherford	Fine-loamy, siliceous, thermic Ultic Haplustalfs
Windthorst	Fine, mixed, thermic Udic Paleustalfs
Yahola	Coarse-loamy, mixed (calcareous), thermic Typic Ustifluvents
Zaneis	Fine-loamy, mixed, thermic Udic Argiustolls

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